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REPORT
ON THE
PROGRESS OF OPHTHALMOLOGY,
1872.

PREPARED FOR THE
AMERICAN OPHTHALMOLOGICAL SOCIETY,

BY
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As the Society's Committee, I herewith have the honor to make my Sixth Annual Report on the Progress of Ophthalmology. Again I am led to place a memorial dedication at the head of my contribution, which I know will meet the hearty approval of all the members of the American Ophthalmological Society. There are a number of other younger men whom death has the past year taken from our ranks, but I join with Professors Arlt, Donders and Leber, in calling Jäger the Nestor of ophthalmology in the "Vaterland."

The great event of the year has been the meeting for three days, in London, August 1-3, 1872, of the International Ophthalmic Congress. Here I may be pardoned in adding, that the invitation I had the honor of suggesting was so warmly extended by our President and Secretary, that the Congress has voted to meet in America in 1876, the year of the celebration of the Centennial Anniversary of American Independence. As the originator of the invitation, I claim the privilege of saying, my idea was that the Congress should not meet in any one of our large cities, but at Newport, for the same reasons that carry the American Ophthalmological Society to that place in preference to all others, for its annual meeting. This remark I make in consequence of a recent notice in Prof. Zehender's Journal of Ophthalmology.

The Report of the London Congress will appear from official sources. An edition in French is already advertised at 12 fr. 50. I therefore append only an outline of its proceedings, taken from my notes during the several sessions.

Wednesday evening (July 31) there was a preliminary meeting for inscribing names. One hundred and over did this. Of these, eleven were members of the American Ophthalmological Society, viz. :—Drs.

Mr. Teale (Leeds) read a paper on his operation for Symblepharon, and showed two patients who had been operated on.

Dr. Wolfe (Glasgow) explained his own method for this operation.

Dr. Javal (Paris) presented the report of the committee of the Congress, recommending metrical and decimal series in trial glasses.

Dr. Schmidt read a paper on the distention of the optic nerve sheath, in optic neuritis.

Dr. Green (St. Louis) read a paper on test types modified from Snellen's.

Dr. Williams (Boston) repeated his invitation for the Congress to visit America in 1876.

Dr. Delgado invited it to Madrid.

After considerable discussion, the Congress decided to meet in America, in 1876.

At 1 o'clock, the Congress adjourned till 4, when Mr. Power (London) read a paper on Transplantation of the Cornea.

Dr. Williams (Boston) showed his needles for stitching the cornea in cataract operations.

Mr. Bowman (London) spoke of the following operations:—1st, for precisising and placing an artificial pupil; 2d, for removal of dense papillary membranes; 3d, for double iridectomy on the same eye by two knives at the same time; 4th, for conical cornea, by trephining the cornea and other methods.

Dr. Quaglino (Naples) spoke on "Sclerotomy in Glaucoma."

Dr. — on "Cutting the Sclerotic for Glaucoma."

Dr. Noyes (New York) exhibited eye specula, and showed his form of register to be used in writing out cases.

Dr. DeWecker (Paris) then proposed that, the hour of 3 o'clock having arrived, the Congress listen to Prof. Donders, which the members did with the greatest attention. He spoke of and exhibited an instrument for measuring the distance between the lens and cornea. He then criticized and exploded Förster's idea that accommodation will take place when the lens was absent (great applause). He also spoke on traumatic keratitis, and in reference to the pus cells and the corneal corpuscles.

Dr. DeWecker proposed thanks to the London members for the reception given to the Congress. Prof. Donders, in behalf of the Congress, thanked the College of Physicians for the use of its Hall, and in a very impressive and elegant manner bade the Congress adieu. The members then took the train for the Crystal Palace (Sydenham), where the dinner took place.

The following papers were recorded, but their authors did not have time to read them, and they were deposited with the Committee:—

"On Atrophy." By Jabez Hogg.

"Cerebral Amaurosis." Hunt.

"Observations on Tumors of the Globe." Vernon.

"Absolute Correction of muscular deviation of the Eye." Cowell.

"Practical Observations on the determination of visual Acuity." Gayat.

"Cauterization of the Lachrymal Sac." Quaglino.

"On Keratoconus." Secondi.

In the following pages, I have briefly sketched—

The “Report of the Heidelberg Meeting” of last year, and what has been published, up to Jan. 1873, since my last report, in

“Archiv für Ophthalmologie.”

“Klinische Monatsblätter für Augenheilkunde.”

“Annales d’Oculistique.”

“Royal London Ophthalmic Hospital Reports.”

“Archives of Ophthalmology and Otology.”

“Annali d’Oftalmologia.”

“Journal d’Ophthalmologie.”

I have, as in previous years, also sketched some of the books and monographs published, and the scattered articles in various reviews and society reports. Appended is a list of those which time and space have failed me to notice as they came through my hands or into my library.

Heidelberg Ophthalmological Society. Meeting of 1871.

Section of the Optic Nerve. Dr. BERLIN.—In agreement with other observers, he found peculiar retinal opacity and subsequent pigmenting after injury in man severing the nerve, and after experimental section in animals.

Sclerotic Section as a Glaucoma Operation. Dr. WECKER.—He concludes that “the cicatrix in the sclerotic and the process of filtration which goes on through it, are causes of the success of the operation for glaucoma. This cicatrix (aside from the cystoid cicatrix) differs entirely from one made in an iridectomy for artificial pupil, and quite deserves the name of “filtration-cicatrix.”

The Refractive Condition of the Atropined Eyes of 240 Village-School Children. Dr. COHN.—In criticism of Erismann’s article on a similar subject, he says, “of general interest is only the question of the injurious effects of concave glasses for all young myopes.” This Cohn denies, and refers to Woinow and Knapp; moreover, his own researches tell him “that there is no decrease in the degree of hypermetropia with increasing years.” “The shape of the healthy eye of village children of from 6 to 13 years is not emmetropic, but always slightly hypermetropic, and even normal eyes must accommodate for the distance.”

Herpes Corneæ. Dr. HORNER.—He thinks we may have an herpetic eruption on the cornea not differing from that occurring in zoster, except the absence of the other symptoms of *H. zoster ophthalmicus*. Horner’s article gave rise to considerable discussion and interchange of experiences. The general impression seemed to be what I should, as a dermatologist, endorse, namely, that this form of herpetic symptom on the cornea rather bore the relation to zoster eruption than herpes labialis or progenialis does to zona.

Light Perception in Diseases of the Choroid and Retina. FÖRSTER.—He exhibited an ingenious apparatus for measuring the light perception. He found that in those diseases where only the conducting apparatus of light impression was affected (nerve fibre and ganglion layer), this power was not at all or only slightly affected relatively to those diseases where the receptive apparatus was implicated, choroid and retinal pigment.

A Photometer.—HUPPEL, in connection with the remarks of Förster,

exhibited and explained his instrument for measuring light impression.

Box of Trial Glasses.—SCHULEK exhibited one containing 8 plano-concave and 8 plano-convex, by combining which we may have 25 separate glasses, and thus quite a series. Zehender's similar arrangement held 10 plano-convex and concave, giving by combination 30 glasses.

The various Size and Degree of Illumination of the Visual Field in examining Hypermetropic and Myopic Eyes with the reversed Image.

DOBROWOLSKY.—The size of the visual field he found

in E. = 60 quadr. mm.

in H. = $\frac{1}{5}$ = 45 “

in M. = $\frac{1}{5}$ = 77 “ by a second reckoning.

in E. = 92 quadr. “

in H. = 73 “ “

in M. = 112 “ “

Now, whichever of these measurements we take as nearest the truth, we have thus explained how it is that we rarely see the fundus of a myopic eye as clearly and distinctly as in the hypermetropic or emmetropic, even those parts most prominent in comparison, as the papilla.

Relation of the Macula to the Papilla.—This he shows, also, is changed in a myopic eye. In an elongated globe from staphyloma the papilla is shortened laterally, and appears an oval when the enlargement is at the side of the papilla, and shortened vertically, thus becoming a horizontal oval, when the distention of the globe is above and below the papilla.

In examining a myopic eye, if we hold the lens so as to have the pupil in focus, our multiplication is less than in an eye of other refraction. To increase the multiplication we move the lens away from the eye, but at the same time the illuminated portion of the retina is increased in size, and hence the part adjacent to the papilla becomes less illuminated, so that finally the papilla itself seems only to be seen.

Power of Filtration of the Cornea. LEBER.—He concludes that the membrane of Descemet prevents filtration, which point was discussed and disagreed with.

Measurements of Intraocular Pressure. MORANO.—He has not yet arrived at full conclusions from his experiments, but cannot but think at present these will lead to further knowledge of the relations between the external influences on the globe (muscles, &c.), and the internal morbid symptoms, as also the anomalies of refraction and accommodation, affections of the iris, coroid, retina, &c.

Diagnosis of Color Blindness.—WOINOW exhibited a rotation apparatus, the inner disk black and white, next a ring of red and green, next a ring of violet and red, next outside of violet and green. When rapidly rotated the centre appears of course gray, i. e. of black and white mixed. The outer ring also gray to the red blind, as he can form gray from the two colors he sees. The middle ring gray to the green blind, as from violet and red he can see gray, and the inner ring gray to the violet blind, as red and green give him gray. Woinow also reported a case of *unilateral green blindness*.

Arterial Retinal Pulse in Aortal Insufficiency. BECKER.—He concludes that in all cases of insufficiency of the aortic valves uncompli-

cated with other valvular trouble, a spontaneous arterial pulse may be observed. This will be the more evident, the greater the concomitant hypertrophy of the left ventricle. The spontaneous pulse was only absent, where besides the valvular insufficiency there was great anæmia or fatty degeneration of the heart. This pulse is seen not only on the papilla, but as far towards the periphery as the ophthalmoscope allows us to see. An exhaustive article on this subject is in the 18th Vol. of "Græfe's Archiv," Part I., 1872.

Motion of the Eye-ball around the Optic Axis. WOLNOW.—He found in every case that there was the same proportion between the motion and the inclination of the head, independent of the degree of convergence of the visual lines.

Report on the Progress of Ophthalmology. NAGEL.—This has been published in book form of 488 pages. Although it is stated to be for the year 1870, it is by no means confined to this time alone, but is rather a sort of resumé of ophthalmic literature for the past few years. All ophthalmic surgeons familiar with German, must thank Dr. Nagel for the immense amount of work he has been through, since it puts them in position to run over the newest ideas and experiences of others, in the shortest possible time. The indexing is especially convenient and good. This I desire to state freely and fully, although to other American ophthalmic surgeons, as well as to myself, I consider Dr. Nagel has not been strictly just in his criticisms or translation.

Strychnine in Cramp of Accommodation. NAGEL.—Where atropine failed, he found strychnine of value, subcutaneously injected, in doses of $\frac{1}{30}$ to $\frac{1}{20}$ gr. to relieve spasm of the ciliary muscle.

Pathology of Iris Cysts. ROTHMUND.—This is an abstract of a more complete article to be published in Zehender's Monatsblätter. He says there are two forms of iris cysts:—

1. Epidermoid, composed of epidermis cells.

2. Cysts with watery contents and enveloping membrane lined with epithelium.

With the first form, there is an accompanying wound of the skin in the neighborhood of the eye. The cyst apparently is formed by a piece of skin forced into the iris and giving rise to epidermoid ulceration.

The second form, with certain exceptions, occurs only after injury, and comes, also, in similar way from the conjunctival covering of the cornea. Hence extraction and not puncture of these cysts is in place. Considerable discussion followed Nagel's communication.

Symptomatology and Etiology of Divergent Squint. SCHULEK.—He concludes that divergent strabismus is not an affection of the external recti, but of the internal recti muscles. There is another relation between convergent and divergent squint than that generally accepted, namely: Excessive action of the internal causes convergent strabismus, lessened action of the internal causes divergent strabismus. Both depend on the internal. Of course the external deviation is produced by the external, but they normally pull whilst the internal abnormally yield. This view affects treatment, for we must of course not attempt to weaken the external recti by setting them back, but strengthen the internal by stitching them forward. We may, perhaps, by cutting the external, when there is very slight divergence, correct the squint. In greater degree, we must stitch forward. Considerable

discussion followed, with explanations by one and another of their various methods of stitching.

Operation for Trichiasis.—KNAPP explained what Schulek published as his own method. But Prof. Arlt said that his son learned it from Snelling, and told Schulek of it.

Methods of Plastic Operations.—KNAPP spoke of his recent results.

Pathological Specimens. PAGENSTECHER.—Discussed in reference to the origin of bone in the globe.

The Power of Convergence, its Execution, Conditions and Effects. MANNHARDT.—He finds that the same anatomical shape of the head which gives a wide distance between the eyes, causes also an original position of divergence. Thus both data exist together, which hinder convergence. And the same shape which gives less distance between the eyes, gives also a tendency to original convergence, and hence to hypermetropic shape of the eye. A discussion followed by Woinow and Mannhardt in reference to the angle alpha, cut short by the president as too far from the subject.

The Distance between the Fovea Centralis and the Centre of the Blind Spot in Eyes of Different Refraction. DOBROWOLSKY.—According to whom—1. The distance between macula and papilla varies in emmetropic eyes from 3.915 and 5.467 mm. 2. In hypermetropic eyes the distance between macula and papilla, was in moderate degrees of H. greater than in emmetropic eyes. In high degrees of H. this distance becomes gradually smaller, till finally it reaches the same or even less than emmetropic eyes. Strabismus convergens generally comes with moderate degrees of H. 3. In myopic eyes, namely, if moderate M. this distance between macula and papilla varies but little from the emmetropic. 4. In all individuals whose refraction varies in the two eyes, this distance varies also, being greater in the eye of least refraction. This whole paper was doubted by Knapp as “absolutely inconceivable.” Dobrowolsky could not speak German sufficiently well to defend his position before the society.

Spontaneous Cure of Hypermetropic Squint and the Limiting of Tenotomy. WECKER.—He says he has no doubt whatever that simple convergent hypermetropic squint may cure itself with increasing age, i. e., if we may regard the gradual loss of convergence as cure and not the restitution of binocular vision. Also that 8 to 10 years after operation we may have divergence. This was agreed to by others in the discussion which followed by Cohn, Nagel, Mannhardt and Horner.

Peculiar Forms of Sympathetic Trouble after Gun-shot Wound. COHN.—The case is given in extenso with thirty others in the report of the volunteer surgeons from Breslau, published by Dr. Fischer.

Astigmatism after Cataract Operations. WOINOW.—If we give a patient after cataract operation a cylindrical glass with a spherical, they serve very well for the distance. The same cylindrical, however, with another spherical does not serve for the near. I have several times had cases where quite a different cylindrical was necessary for the near, and in some where a different axial direction was required. This may be explained by these patients rotating their eyes when converging for the near. As to the different cylindrical necessary, I do not understand. It cannot be from accommodation. To my results I would call attention, since experiments are now made as to far and near vision, in cataract patients, and they are said to overcome pretty considerable circles of dispersion.

Pathological Specimen. DONDERS.—He stated that he considered a specimen passed round with the inquiry as to whether it went into the eye or was formed there, to be simply true bone formation.

The Angle Alpha.—DONDERS made an explanation in reference to what had been previously said in the society on this point.

Congenital Absolute Color-blindness. DONDERS.—An educated young man of 21 years of age was totally color-blind. Strong light blinded him, in moderate light he saw very well. He was myopic $\frac{1}{2}$, and read for hours without glasses. Out of doors, all glasses which absorbed light, without difference, even the brightest colored ones, were pleasant to him, because they reduced the light. In the dioptric spectrum of a gas lamp his brightest part was between the spectral lines D and E, close to E, hence in greenish yellow. From here outwards towards the red end the light faded rapidly; towards the violet, at first slowly, then rapidly. By moderate illumination he lost less of the brightness of the spectrum on this side than towards the red end. With the polaroscope, the complimentary colors through the quartz plate appeared to him of the same color. In turning the double refractive prism, he had a maximum of brightness at every 90° , or equality of brightness, as if the quartz plate was not there. He had the greatest difference where Donders himself saw purple and green, equality where he saw yellow and blue. Trials were also made with Chevreul's chromatic circle. These and other experiments would show that the patient possessed only one of the three energies, namely, the one most excited by the middle portion of the visible spectrum. Does now the color which was brightest in this case correspond to the middle energy? Cases of so-called green blindness do not positively decide this. Maxwell, however, from his comparison of the three colors with white, showed that green was the middle energy, and J. J. Müller's experiment gave the green between E and b its own peculiar place. This led him, also, to consider this green (only more saturated) as one of the three energies. They therefore found green, whilst Donders's patient found yellowish green the brightest spectral color. In this Donders does not find any contradiction, for since we use a dioptric spectrum in which the light has increasing dispersion from the red to the violet end, then when only the middle energy is active, its maximum must be pushed towards the red side, just as the heat maximum which probably lies in yellow, will be found outside of red. With the polanscope, green was also, as opposed to purple, the brightest color. The case shows most conclusively green to be one of the three energies.

Wecker here spoke of a case of a girl of 12 years born blind and microphthalmic, the eyes being no larger than peas. Nothing was to be seen of the cornea, but a rather less blue oval spot where it should be. The child was quite insensitive to quantitative light, but could distinguish the finest nuances of color.

Becker also related another case where one eye was so small as to have no sensation; the other eye, which was also very small, possessed however perfect perception of color and color nuances. This is the only sensation the person had—squares, to be distinguished from circles, must be very large and bright, whilst their colors were perfectly recognized.

Helmholz's Empiristic Theory. DONDERS.—From the study of patients

operated on for squint, he thinks Helmholtz's theory will not hold perfectly good. For without practice or control, after many years, the restored binocular fixation of a point *immediately* calls out a correct stereoscopic picture of one not fixed from the two retinal impressions—as from intuition—since the persons are not in condition to observe the governing data.

Graefe's Archiv für Ophthalmologie, vol. xvii. 2; vol. xviii. 1, 1871-72.

Projection of the Visual Impression in the Direction of the Visual Line.—Prof. DONDERS, in an article explanatory of Hering's differences with him, gives the following headings. First in direct vision.

1. A near object which we fix with both eyes will be there seen where it really is. We have a correct notion of its position in reference to ourselves; i. e. in reference to the space occupied by our bodies.

2. At the place where the fixed point really is, the visual lines cross.

3. Our imagination (*Vorstellung*) places then the fixed point in the point of intersection of the visual lines.

4. Our conception of the position of the fixed point depends on, or comes from, the knowledge or recognition of the innervation of movement to bring the visual lines to there intersect.

5. We recognize with Hering an innervation for the directing the double eye, i. e. the two eyes together, upwards, downwards, right and left; besides these, for adduction and abduction. The first four we join under the name of directing-innervation; the last two as distance-innervation.

6. We estimate the directing-innervation with great accuracy.

7. The distance-innervation also we estimate sufficiently well for near objects: *a*, from the necessary convergence we determine the distance; *b*, and from the determination of the distance we regulate the innervation for movement.

8. The idea of distance is affected by the peculiarities of the object (light and shade, size, perspective, form, et cetera). These, in ordinary vision, correspond to the real distance, and act then the same way as the distance-innervation. This last may, by artificial means, be brought in conflict with the former, and when this occurs the innervation may not perfectly govern the conception.

Projection in Indirect Vision.

9. What we see as a single object with both eyes indirectly, appears at the crossing of the visual lines.

10. When double pictures are given, but are combined in the imagination to a single one, then the object appears also at the point of intersection of the visual lines.

11. When the two pictures are not combined to a single one of the object, then they appear as two objects. The direction in which these appear relative to the point of fixation, is determined for each by the angle in each eye made by the line of direction of the retinal picture with the visual line. When all other suggestions are removed, we determine the distance as that of the fixed point. In ordinary vision, however, we know the distance, and then the idea gained from that readily determines.

Finally, therefore, we come back to the old statement, namely, that

directly, we see objects when the innervation of motion brings the visual lines to cross; and indirectly, we see with each eye at an angle to the visual line, determined by the line of direction of retinal point affected.

Muscular Asthenopia and Myopia. J. MANNHARDT.—The author would show that the natural and hence the national conformation of the head will lead to asthenopic myopia.

Ophthalmic Dispensary at Wiesbaden.—Dr. Pagenstecher contributes an article on—1. Hæmorrhagic glaucoma, illustrated by three cases. 2. Glaucoma with hæmorrhage. 3. Pathological anatomy of choroiditis disseminata.

On the Size of the Image in a Combination of two Optical Systems. Dr. Hock.—He deduces,

1. When in a combined optical system the object is at the primary focus of the primary system, then the pictures in all the distances of the two systems are alike.

2. When the object is beyond the primary focus of the primary system, then if the distance of the system is smaller than the primary focus of the secondary system, or the secondary focus of the first, or the sum of the two foci, we shall have an inverted image, which will be smaller the further the object is from the first refracting system.

3. When the object is within the focus of the first system, the picture, if the distance of the system is greater than the sum of the posterior focus of the first and the anterior focus of the second system, will be inverted, and smaller the nearer the object approaches the first system.

4. When the object is within the focus, then the picture, in case the distance of the pictures is smaller than the primary focus of the second or the secondary focus of the first, or the sum of the two foci, will be reversed, virtual, and larger the nearer the object approaches the first system.

5. When the distance of the two systems is equal to the sum of the anterior focus of the second and the posterior focus of the first system, the picture is inverted, and alike for all distances of the object from the first system; thus also the same when the object is at the focus of the first system.

6. When the object is beyond the focus of the first system, we shall have an inverted picture increasing in size whilst the distance of the two systems increases, to the point where the product of the positive difference of this distance and the sum of the anterior focus of the second and the posterior focus of the first system, into the anterior focus of the last lessened object's distance, is smaller than the product of the anterior into the posterior focus of the first system.

7. When an object is within the focus of the first system, the inverted image produced is smaller the greater the distance of the two systems.

8. When convex or concave glasses are at the anterior focus of the hypermetropic or myopic eye, the pictures produced through them are of the same size as those produced by objects at the same distance in the emmetropic eye.

9. When an object is at the focus of a magnifying glass, the pictures are the same at all distances of the glass and the eye.

10. The fundus of an emmetropic eye gives a picture in another eye

observing it, which is just the size of pictures of the first and second eye. The distance apart of the two eyes is here of no consequence.

Prof. Donders follows the article with an explanation from himself in reference to it, and Knapp's deductions, which must be read in connection with Hock's article.

The Mechanism of Ocular Movements. Dr. E. BERLIN.—A lengthy article with illustrations, impossible to sketch here.

On Ocular Movements. Dr. M. WOINOW.—To be read with Dr. Berlin's.

Melanotic Tumor of the Cornea. Prof. MANZ.—A rare case well described.

The Nerves of the Conjunctiva. Dr. FRANZ MORANO. Illustrated.—He concludes that: 1. The connective tissue of the conjunctiva is rich in nerves, but the epithelium very poor. 2. The conjunctival nerves reach to the epithelial layer, and the finest fibres are distributed probably in the intercellular spaces. This explains the sensitiveness of the conjunctiva, well known clinically, and yet at variance with our histology.

Diagnosis of Color-blindness. Dr. M. WOINOW—in which he describes his special apparatus for testing for color-blindness.

Hereditary and Congenital Optic Nerve Diseases. TH. LEBER.—1. Retrobulbar neuritis optica, central scotoma, transmitted in collateral line. 2. Retrobulbar neuritis and neuro-retinitis optica in three children of one family, partly acute, partly chronic, cured. 3. Retrobulbar neuritis in two children, resulting in great amblyopia and final complete blindness from atrophy of the optic nerve. 4. Central scotoma, a sequela of retrobulbar neuritis, transmitted in collateral line. Comparison of the cases shows that hereditary amaurosis in the families observed, was caused by neuritis of the optic nerve stem, which commenced as retrobulbar neuritis or neuro-retinitis, resulting in partial, more rarely total, atrophy of the optic nerve.

Remarks on Dr. Erismann's Examination of the Eyes of School Children. Dr. COHN, who also contributes an article on the

Refraction of the Eyes of 240 Atropined Eyes of Village School Children, with these conclusions:—

1. More than 88 per cent. of the village children are emmetropic.
2. Anisometropia but rarely occurs.
3. Ametropia occurs twice as often with boys as with girls.
4. Myopia does not occur in 1 per ct.
5. The few myopes were only slightly so.
6. Facultive-manifest H is more frequent (right 77 per ct., left 64).
7. In girls Hm is more frequent than in boys.
8. The number of Hm does not lessen from the 6—13 year.
9. All grades of Hm occur from $\frac{1}{30}$ to $\frac{1}{10}$, most frequently H $\frac{1}{60}$, the stronger the more seldom.
10. The average of Hm is small (right $\frac{1}{53}$, left $\frac{1}{63}$).
11. Under atropine every village child is hyperopic.
12. All grades of Ht occur from $\frac{1}{30}$ to $\frac{1}{2}$, most frequent $\frac{1}{36}$ to $\frac{1}{20}$.
13. The average of Ht is small (right $\frac{1}{35}$, left $\frac{1}{50}$).
14. The degree of Hm and Ht do not seem to vary with the sex.
15. Neither Hm or Ht exhibit a decrease in amount with increase of years.
16. Nearly all village children have $S > 1$, the most $S=2$, many $S=2\frac{1}{2}$, a few $S=3$.

Vol. xviii., Part i., 1872.

Contribution to the Study of Glaucoma. Dr. RYDEL.—We translate his final interesting paragraph. “We know how the degree of intra-ocular pressure varies in a glaucomatous eye. Experience shows that an eye which at one examination is nearly as hard as a stone, on the next day, or it may be in a few hours, will be found to have only a moderate degree of pressure, &c. More careful examination proves to us that this variation in pressure may have a very regular type, so that at certain times of the day the eye will be harder, and at others softer. Increase of pressure accompanies loss, and decrease of pressure gain of visual power, corresponding to the varying interrupted retinal circulation. Now, these variations of intra-ocular pressure do not cease with complete blindness, but last till the globe becomes atrophic, and I think will explain and cause the variation in light and darkness. I imagine, in the later stages of glaucoma, where the retinal arteries are already atrophic, an increase of intra-ocular pressure may quite stop the arterial blood coming to the eye, and the patient then has a sensation of darkness. If the pressure now subsides, the *vis a tergo* may overcome the vitreous pressure, the blood streams in again, and, irritating the retinal elements, brings a sensation of light, which continues till the subsequent increased pressure stops the blood flow once more. I need not add that the complete amaurosis, or total loss of response to the irritation of light, would not militate against this suggestion, since the optic nerve fibres (in our case by the flux of blood), when irritated, give the sensation of light, even when the retina has long lost its reaction to light.”

Contribution to our Knowledge of Metastatic Irido-choroiditis. Prof. SCHMIDT.—He says that the capsuling of pus escaped through a sclerotic opening is extremely rare in metastatic irido-choroiditis. He has seen two such cases which he describes. He closes with a consideration of the group of symptoms accompanying unilateral exophthalmos.

Neuro-retinitis, with a Cerebral Tumor. Dr. ROSENBACH.—The case is most carefully given in extenso. It was observed whilst the author was assistant to Prof. Schweigger, at his clinic in Göttingen, in 1869. It is fully illustrated by six carefully prepared figures, without which any description would be rather at fault.

Contribution to Physiological Optics. Dr. SOBROWOLSKY.—In reference to rotation of the eyes in convergence and accommodation, he concludes that “if the position of the object in reference to the visual line does not alter, the direction of the sensible vertical meridian remains the same with parallel and with convergent visual lines. The effect of convergence is therefore the same as in the primary position.”

The same author follows in considering the sensibility of the eye to various spectral colors; also, its sensibility to the intensity of light of various spectral colors; also, the gradual increase and decrease of light intensity in various spectral colors, during the gradual increase and decrease of the strength of the whole light; also, the sensitiveness of the eye to tones of color.

Bony Formation of Human Crystalline Lens. Dr. BERTHOLD.—He finds, 1st, that the most frequent point of commencement of ossific deposit in the human eye is the choroid. 2d, that ossification may take place in the iris, and such product be mistaken for an ossific lens. 3d, the *corpus ciliare* shows the least tendency to ossify. 4th, ossification of the human crystalline lens is not yet proved.

Ophthalmoscopic Picture of the larger Retinal Vessels. Dr. SCHNEL-
LER.—A long and interesting paper, illustrated by eight figures. From
his injections he concludes, that the *sub-vaginal* space communicates
with the *supra-vaginal* by irregular openings in the outer optic sheath,
and by similar openings in the sclerotic with the perichoroidal space.
The latter connects by the perivascular space around the *venæ vorti-*
cosæ with the Tenon's space, so that injecting material, on the one
side through the spaces of the optic sheath, on the other by the scler-
otic spaces, meets in Tenon's space, or the supra-vaginal space imme-
diately connected with it. The sub-vaginal space and the other spaces
are, according to Schwalbe's examinations, to be regarded as lymph
spaces. The proof of the communication of these spaces, and their
being lined with endothelium plates, go towards showing that they are
the roads for the movement of the lymph.

A new Method of determining the Optical Constants of the Eye. Drs.
MANDELSTAMM and SCHÖLER.

Pigment Deposit in the Parenchyma of the Cornea. Dr. HIRSCHLER.—
He calls attention to certain deposits of pigment in the *cornea pro-*
pria, which he figures, and has seen cases of: 1st, keratitis dif-
fusa parenchymatosa. Iritis serosa. Pigment deposit in both eyes.
2d, keratitis parenchymatosa, episcleritis, iritis double. Pigment de-
posit in left eye only.

The Visible Movement of the Blood in the Retinal Vessels. Dr.
BECKER.—An elaborate and interesting article of ninety pages, of es-
pecial value to those who are using the ophthalmoscope in general
medicine.

Refutation of the latest Objections to Graefe's Linear Extraction. Dr.
JACOBSON.—This is much too long to be sketched here, and should be
read carefully by all those now becoming ready to adopt Liebreich's
bold cut through the cornea, as well as those who are reporting on
Graefe's operation, which they in reality never carry out as he said it
must be, to insure the success he had with it. Vide Errata in vol.
xviii., Part ii., 1872.

Anatomical Examination of Typical Retinitis Pigmentosa. Dr. LAN-
DOLT.—A case which had been frequently seen during life in Professor
Hörner's clinic, came under the observation, *post mortem*, of the au-
thor, who reports his very careful histological examination, and illus-
trates it with figures.

Effect of Optical Glasses on the Power of Vision. Dr. WOINOW.—
A short article, to be studied with those of Knapp, Hock, Donders
and Mauthner.

Remarks on Dr. Morano's Article on "The Nerves of the Conjunctiva."
Dr. HELFREICH.—A criticism, to be read with Morano's communication.
Vol. xviii., Part ii., 1872.

On Keratitis. Dr. S. TALMA.—This article gives the results he pub-
lished last year in a communication published in Dutch, in reference
to the origin of the pus corpuscles in traumatic keratitis. It was to
endeavor to decide whether all the so-called pus-cells of the inflamed
cornea were white corpuscles, or whether a part at least were not de-
rived from the substance of the fixed corneal corpuscles. The result
of his study is, that all pus cells in traumatic inflammation of the cor-
nea are wandered blood corpuscles.

Histology of the Lamina Cribrosa. Dr. WOLFRING.—He concludes

that it is not a net-like modification of the sclerotic tissue, through the openings of which pass the bundles of the optic fibres; for the sclerotic passes directly into the optic nerve sheath, simply leaving an opening for the nerve. Moreover, there are no free bundles of connective tissue passing from the sclerotic to form such a network. The connection of the optic nerve and sclerotic is rather caused by the numerous vessels of each, only, however, to be seen in fortunately injected specimens. In the lamina itself then is simply the connective tissue belonging to the perineurium and its subdividing bloodvessels. Hence, the important difference between sclerotic and lamina in resisting pressure, as seen in optic excavation in glaucoma from increased intraocular pressure. Here, as is known, the papilla is pushed back beyond the plane of the inner scleral surface into the nerve sheath, forming thus a kettle-shaped depression, without the neighboring portion of the sclerotic being turned or pushed outwards.

The Relations of the Circulation in Optic Nerve and Retina. DR. LEBER.—1st, The arteria and vena centralis retinae supply not only the retina and papilla, but, also, in common with the vessels of the sheath, the optic nerve as far as they run in it. 2d, The vessels of the optic nerve run everywhere within the connective tissue spaces throughout it. 3d, The condition of the branches of the sclerotic vascular circle is, with slight modification, a repetition of the condition of the sheath vessels of the optic. 4th, Hence, the lamina cribrosa, papilla and a small part of the retina are all supplied by the central and ciliary vessels.

Use of Strychnine in Amblyopia. DR. WOINOW.—He reports three cases. "Where there is visible change in the retina or choroid, strychnine is most generally of no use. It was of value in troubles of the optic and in amblyopia, when no such affections could be seen by the ophthalmoscope to explain them. It was noticed that in otherwise similar cases strychnine was only of value when, with much reduced vision, nuances of color were still appreciated. In all cases (the above excepted) where there is blindness to any one color, the remedy failed, even when vision had not been very much reduced, e. g. $S=\frac{1}{2}$. Where strychnine helped, it was at the commencement of the treatment; for instance, the first two injections are sufficient to definitely decide whether the remedy will be of avail. This is a valuable fact, as thus any patient may be treated without omitting other remedies. Physicians too often limit themselves to strychnine alone. No evil effect on the general constitution was observed. Naturally, it was interesting to know how long strychnine helped, in other words how lasting its good effects were on vision. This, time does not yet allow to be answered with certainty. One patient was seen from two to three months, and another seven and a half afterwards; in both, the continuance of the effect was observed. In one case, however, besides strychnine, other treatment was used, directed entirely to the cause.

Remarks on the Use of Spectacles. DR. WOINOW.—He speaks of the use of concave and convex glasses where, aside from the refraction, the question of convergence of the eyes is to be considered. Statistical data and the study of external squint clearly show that the myopic eye, oftener than the other, suffers from symptoms of muscular asthenopia, due to insufficiency of the recti interni muscles. In such

cases, where the degree of insufficiency is slight, and the patient refuses operation, we must needs employ a symptomatic treatment, and order glasses. Amongst these, of course, first come prismatic glasses with angle outwards. The use of prisms, however, is comparatively limited, from their weight and chromatic aberration. In all cases of myopia where the patient's occupation requires the object very near, he must use concave glasses or these combined with prisms. By concave glasses, we lessen the angle of convergence and thereby lessen the necessity for the latter, and thus relieve the call on the internal recti. The prismatic action of glasses being well known, it is of value to calculate their effect in various relations of the optic axis to the centre of the glass. This is done, and given in a table for Numbers 24, 20, 16, 14, 12, 10, 8, 6.

Lymph-adenoma of the Orbits. I. ARNOLD and O. BECKER.—A man, æt. 34, has been troubled, from the age of 19, with an affection of the conjunctiva. At the age of 30, there was double exophthalmos. This was caused by a sensible tumor behind the fascia tarso-orbitalis in the region of the lachrymal gland. Both tumors were extirpated by the knife. Normal position, movement and function of the eyes returned. The secretion of tears is not much diminished. Subsequently, posterior symblepharon occurred. Examination of the extirpated tumors proved them to be lymph-adenoma. No return at the end of twenty months.

Circular concentric Defects in the Visual Field. Dr. HERSING.—An interesting paper with reports of cases. I quote his last paragraph. The course of the retinal veins does not seem to have been taken into account in these circular scotomata. Perhaps in other cases also the correspondence in position would have been noticed, as these and the form of the circular defect were characteristic in the cases noted, varying only in dimension. The ophthalmoscope often shows two thick veins running, one above, the other below, around the macula lutea, whilst others going in other directions have, relatively, much less calibre. If, now, there is choroiditis, syphilitic or otherwise, the retina will be more likely to become implicated near these thick veins, and fastened to the choroid, hence destruction here of the rod and cone layer rather than elsewhere. With this goes the fact that in the majority of the observed cases the blind ring spreads, destruction of the percipient elements taking place still further. In the cases of pure nerve or retinal atrophy, with pigment deposit, it does seem explained why, in a retinal zone typical in position and condition, the rods and cones disappear before they do elsewhere.

Entropium of the upper Lid. Dr. E. BERLIN, in Palermo.—He proposes a new method of operating for it, adding the experience of Dr. R. Berlin in Stuttgart.

Retinitis Albuminurica with Detachment of the Retina. Dr. BRECHT.—These cases occurred during pregnancy. He says the ophthalmoscopic results were quite similar, viz., alterations in the choroid, narrowed arteries and discolored papilla, sometimes excessive, although good vision remained, and the visual field was normal. In one eye of one case there was, however, good central vision with marked lateral contraction, due, apparently, to local choroidal change, as the white papilla could not mark progressive atrophy, since in another case the same existed with normal vision and visual field. Perhaps many cases which would be considered retino-choroiditis, choroiditis dissemi-

nata, &c., are but the remains of previous retinitis albuminurica. The retinal separation seen in one case, proves that even when it is excessive the retina may completely subside into place, provided the eye is of normal form and there is no bulging or staphyloma. The complete and rapid occurrence of this replacement would seemingly show that the fluid was rather dependent on filtration of the tissue than on active choroiditis.

Contribution to our Knowledge of Corneal Tumors. Dr. SCHMID.—Five interesting cases, not readily sketched without the accompanying figures.

Peculiar Alteration in the Tissue surrounding the Retinal Vessels. Dr. OLE BULL.—This he attributed to the lymphatics, being a dilatation of the vascular sheath or the perivascular spaces (if such exist).

Corresponding Retinal Points. Dr. L. MANDELSTAMM.

Innervation of the Ocular Motion. Dr. SAMELSOHN.—I quote but a single very interesting sentence. "The only possible conclusion from such observations is that the centres of motion of the two globes are separate, and act together only when concerned with defining position. When this is not the case and no combined action is called for, then monocular function may take place. The physiological analogy of this in the animal kingdom is afforded by the chameleon, which moves its two eyes independently."

Congenital and Acquired Association. Prof. DONDERS.—A few years ago, a series of experiments were carried out by Dr. Adamük, in reference to the action of the corpora quadrigemina on the movements of the eyes, both in dogs and cats. These Donders discusses. His last sentence is, "the organic action of the will on the cells in delicate molecular motion, of the motor ganglia, is 'Himmelweit' from the rough action of the galvanic stream describing its course from electrode to electrode, without regard to the functions or relations of the forms or structures it touches."

Diagnosis of Muscular Insufficiency. Dr. KUGEL.—A long paper. I cannot sketch without figures. He thinks it much easier to explain most pathological relations of the outer muscles by Hering's method of regarding the laws of innervation, than by the method hitherto used.

Report of fifty Cataract Extractions by Weber's Method. Dr. DRIVER.—Resulting thus: $V = \frac{20}{30}$ to $\frac{20}{100}$, 44 eyes = 88 per cent.

Quantitative vision, to be improved by iridectomy, 3 eyes, 6 per cent.

Lost, 3 eyes, 6 per cent.

He closes his report by quoting from Knapp the following: "Weber's is theoretically the most perfect section. When Weber gives us the results, the accidents and the details of some operations, and these prove favorable, we must needs employ his method, since the position and direction of the cut is confessedly theoretically perfect."

Amaurosis after Hæmatemesis and other loss of Blood. Dr. SAMELSOHN.—He concludes that the sudden loss of a large amount of blood produces, of course, a vacuum within the cranium, increased also by the heart's reduced action, and this vacuum must be filled. Now the fluid which may do this in part, is the lymph of the sheaths of the vessels and the arachnoidal space, connected, as shown by Schwalbe, with the space between the two optic sheaths. The action of the heart returning, and the quantity of blood increasing within a few days, the cere-

bral vessels are again filled, which drives out the fluid from the arachnoid spaces, and if the pressure in the lymph passages is also too great, it must needs seek an outlet in the intervaginal space of the optic nerve. Thus the nerve becomes infiltrated with serum, gradually paralyzed by pressure, and finally a growth of interfibrillar connective tissue set up, whence atrophy of the optic nerve fibres. Thus we may have the conditions of a congestion papilla, as in cerebral tumors. That the serous infiltration may disappear, in other cases the connective tissue growth become limited or absorbed, is equally possible with this theory. Whether the trouble is central or peripheral, his cases point towards the latter, and hence open the way to a possible treatment.

Observation of a New Entoptic Appearance. Dr. HEUSE.—It would require his figures to render clear what he has himself seen.

Practical Remarks on the Effect of Glasses on the Acuity of Vision. Prof. DONDERS.—A translation rather than a sketch of this paper should go with the results, hereafter to be given, of the experiments and deductions of Drs. Horst and Klinger, now being made, as Prof. Donders notifies us at the end of his article.

Klinische Monatsblätter für Augenheilkunde—June, 1871—Dec. 1872.

A New Operation for Cataract. Dr. CANSTATT.—A moderately curved needle is passed into the eye behind the lens, the curve towards it. The needle is then entrusted to an assistant, and the ordinary corneal section made upwards. Then the needle is again taken and pressure exerted on the lens, forcing it into the anterior chamber in its capsule, by breaking the zonular attachment. Slight pressure upwards on the lens then forces it through the wound. Five cases were thus operated on successfully in Brazil.

Two Cases of acquired Nystagmus in People living among Mountains. Dr. SHROETER.—This was a rotatory motion worst in twilight, and in a dark day so excessive as to prevent the patient's working.

Dr. Genth gives some interesting cases of injury to the eye during the Franco-German war, which came into the Leipsic Eye Infirmary. Of special interest were several of rupture of the choroid, or choroid and retina. With these should be noticed Dr. Schrag's cases, published as a dissertation, in 1870, at Leipsic, and noticed in this number of Zehender's Journal.

Molluscum Contagiosum. Dr. EBERT.—An extraordinary case is quoted and figured from the Jahrb. f. Kinderheil. und physische Erziehung, Jahrg. 3, p. 152. The tumors on other parts of the face were the size of a pea or bean. Around the eyes they were thickly packed, as large as a hazel or walnut, secreting from their surface a bad smelling, smeary substance. They enclosed the eyes like a wall, preventing their being opened for a time.

Intermittent Blepharospasm.—Dr. SEELIGMULLER, in Halle, reports a curious case of a woman with periodic blepharospasm, and compares it with others here and there recorded in ophthalmic literature.

Reckoning the Astigmatism of the Cornea.—Dr. BERLIN, in Palermo, gives his corrected formula for this.

Clinical Observations.—Exophthalmus ex aneurysmate arteriæ ophthalmicæ dextræ. Ligatura carotidis communis dextræ.

Coloboma iridis et choroideæ, et membrana capsulo-pupillaris perseverans utriusque oculi.

Optic neuritis from lead poisoning.

Separation of the retina during chloroform narcosis.

Leptothrix in the upper canaliculus.

Hydrophthalmus congenitus.

Xanthelasma palpebrarum.

Ophthalmic Casualties from the War.—Sclerotic rupture from a piece of glass; Commotio retinæ traumatica; Ruptura iridis; Iridocyclitis traumatica, ophthalmia sympathica, enucleatio bulbi.

Œdema of the Conjunctiva and its Signification after Operation. Prof. SHIESS, in Basle.—He distinguishes two forms of œdema, a *passive non-irritative* and an *inflammatory*. I will simply quote what he says in reference to œdema after extraction of cataract. "A pale, not extended œdema, in the first few days after extraction, if it remains stationary without corneal or aqueous change, need not influence our prognosis. A pale œdema, however, within twenty-four hours, with peculiar want of conjunctival injection, is of prognostic value. If it extends rapidly over the whole globe, it is a proof of deep-seated inflammation. I have rarely seen a normal result with such œdema. Generally the œdema becomes injected, firmer, and in the best cases there is muddy aqueous, corneal opacity and plastic or purulent iritis. In the worst cases, however, when the whole affair has appeared in twenty-four to thirty-six hours, Tenon's capsule is affected, motion limited, the lids swollen, protrusion, in short imminent acute panophthalmitis; perhaps energetic treatment will keep the whole process within the bounds of purulent choroiditis, with consecutive greater or less phthisis. So also when a pale œdema does not spread, but remains several days in statu quo, not rising with vascularity, but lasting a time as inflammatory œdema of moderate intensity, then we may with certainty decide on stasis in the circulation of the choroid tract. The pupil does not reply to atropine. However, such cases may, and I have seen them, turn out well.

If all has run smooth for three or four days, inflammatory œdema may sometimes occur. For instance, after a restless night, and when the bandage has been disturbed. The patient complains of pain, the eye waters. This œdema is a sure sign not only of iritis commenced, but of choroiditis often becoming purulent. Here also we may sometimes conquer the inflammation, which, with the swelling, gradually subsides. I have, however, oftener observed, frequently with new formed iris vessels, atresia of the pupil, or gradual flattening of the anterior chamber, whereby purulent masses from the vitreous get in front of the iris, and vision finally is lost. Such eyes often become later phthisical.

Clinical Observations.

Gummy Exudations in the Anterior Chamber. Dr. GUNNING.

Double Isolated Choroidal Rupture, with three Ophthalmoscopic Pictures. Dr. HERSING.

Stubborn Epiphora cured by Extirpation of the Lachrymal Sac. Dr. TALKO.

Fistulæ of the Lachrymal Canals. Dr. TALKO.

A New Operation for Spastic Entropium. Prof. SZOKALSKI, with Figures. Dr. TALKO.

Traumatic Rupture of the Cornea.—Evacuation of the globe, and enucleation. Iridectomy of the left eye. Dr. TALCO.

Coloboma Oculi. Dr. JUNGE.—A rhombic coloboma in the neighborhood of the macula, unassociated with coloboma of the iris or any other part of the choroid or retina.

Morphætic Affections of the Eyes. Dr. PEDRAGLIA.—He reports on the usual symptoms of elephantiasis Græcorum, as expressed in the eyes and lids in 14 cases he saw in Brazil.

Two Cases of an unusual form of Acute Myopia. Dr. SHRETER.—These were due, he concludes, to sudden excessive convexity of the lens associated with a relaxed zonula, and not to axial elongation.

Accommodative Power in Aphakia. FÖRSTER.—His measurements and proofs of its existence are given in detail. He finally adds that how accommodation takes place in aphakial eyes he will not attempt to say, only that it must be a physical process, not a physiological one, viz. : the suppression of circles of dispersion. True, this is no explanation, and only answering one enigma with another. He suggests, however, that with absence of the lens the accommodative action may cause the ciliary muscle to bend the cornea more convex.

The Position and Size of the upright Image in the Fundus Oculi. Dr. SCHNABEL.—His statement, the proof of which he would show, is : "The picture of the fundus, to be seen by an emmetropic eye not accommodated, must always lie at infinity, no matter what the condition of refraction of the eye examined, because from infinity alone can the observer obtain a perfect picture, and this picture must be infinitely large, no matter whether the examined eye is normal, myopic, or hypermetropic."

Cysts of the Iris. Dr. ROTHMUND.—He recapitulates and discusses thirty-seven recorded cases, and concludes : 1. That histologically there are three forms to be distinguished—the purely serous, the gelatinous, and the epidermal cyst. 2. As to the pathogenesis, iris cysts occur most generally after wounds (83.3 per ct.). Epidermal cysts are to be all referred to wounds causing transplantation of cutis or hair-sac cells. In other cysts we might suppose a similar growth from loosened and transplanted epithelium of the corneal conjunctiva, or, as Wecker thinks, the wound causes a bulging sac of the iris, and the cyst then holds only aqueous humor. 3. The best treatment is extirpation of the cyst without injuring it. Continuance and growth of the cyst leads to consecutive iritis, ulceration of the cornea and sympathetic trouble ; hence total excision is in place, which settles the diagnosis, whilst discision, or partial excision of the cyst, causes frequent returns.

Kryptophthalmus, a Case of, in an Infant six Months old. Dr. ZEHENDER.—A photograph is given of this remarkable case, observed by the author in his clinic, and which he saw post mortem.

Case of Coloboma of the Lids. Dr. PFLÜGER.

Death following an Enucleation, ten Days subsequently. Dr. JUST.

Traumatic Accommodative Cramps. The same.

Tattooing Leucoma of the Cornea. *Mophthalmus.*—Zehender's remarks on.

The September number contains a notice of the doings of the International Congress at London, in 1872, by Prof. Zehender, one of the Secretaries.

Pigmentary Iritis. Dr. RITTER.—Iritis with pigment deposit in the cornea, possibly from cells wandering from the iritic growth.

Ophthalmoscope for rapid Determination of the Refraction. Dr. COHN.—A modification of Loring's, with the disk of glasses above instead of below.

Cyst of the Cornea. Dr. SAMELSOHN.—An unique case.

Application of Lapis Purus to the Conjunctival Fold in Corneal Affections. Dr. F. HOSCH.—He gives the report, amongst others, of nine cases where asthenic corneal processes were thus treated with great success, one or more applications having been made. "Lapis purus is always used, as in these cases there is danger in delay. We do not, as in the blennorrhagic conditions, make a broad cauterization, but with a pointed lapis pencil, a narrow eschar over the most bulging or swollen part of the conjunctival fold. This is to be immediately neutralized. It is better to dry the part first, to avoid spreading of the caustic. In this way bad conjunctival cicatrices will be avoided. A slight increase of irritation generally follows the application, followed by rapid improvement if the tarsal conjunctiva has not been touched. If the swelling of the conjunctival fold does not disappear after the first cauterization, and no better vascularity appears in the cornea, then the application must be repeated, but not before the eschar has sloughed off. The increased irritation after this application is best combatted by cold applications.

By the stimulus of the cauterization the superficial conjunctival oedema is relieved, and thus a freer circulation takes place in the episcleral vessels. There is no difficulty in making the application. When properly neutralized the pain is not entirely prevented, as Græfe thought, yet amounts to but little. In the majority of cases the procedure need not be often repeated. The result is frequently very perfect, and we have been astonished to see how quickly vascularity was established after proper application of the caustic in cases where all sorts of stimulating remedies had been tried in vain. We would again repeat that this method is only advisable where there is marked swelling of the conjunctival fold."

Simple Glaucoma, with diffuse general corneal opacity. Dr. SCHIESS-GEMUSEUS.

Amaurosis, from poisoning by morphine. Dr. W. WAGNER.

Blepharoplasty; erysipelas in wound, softening of the cornea and atrophy of the globe. Ditto.

Piece of Iron, extracted from the anterior chamber. Ditto.

Cheyne-Stokes's Respiratory Type, with pendulum motion of the globe, rheumatic endocarditis, encephalitis from embolism of the arteria fossæ sylvii dextra. Gottlieb Merkel. This case is published in full in the *Deutsches Archiv f. Klin. Med.*, B. v., page 201, and corresponds to one given in the *Berl. Klin. Wochenschrift*, No. 15, 1870.

Retinal Affections in Surgical Fever. *Deutsche Zeitschr. für Chirurgie* Bd. 1, Sept. 1872, p. 471. Notice of the original, viz.: Embolism and so called Retinitis septica.

Blindness after Scarlet Fever.—Due to kidney trouble with uræmia. Cases fully given in *Jahrb. f. Kinderheilkunde u. phy. Erziehung*, June, 1872.

Basedow's Disease.—Use of galvanism in four cases; fully given in *Berlin. Klin. Wochen.*, Sept. 23, 1872.

Cataract in connection with Nervous Diseases. Dr. S. LONGETSCHWIKOW. From fifteen cases in women between 16–37 æt., with clonic spasms, under his observation, who also had cataract, he concludes: 1st. The causal relation between cataract and general spasms exists not only during childhood, but also in later years. 2d. Cataract of middle life connected with nervous disease is not like the local, generally stationary cortical cataract of childhood, but appears as a complete soft one. 3d. The nervous symptoms are always those of clonic spasm. 4th. The formation of the cataract probably is not due to the effect of the muscular contraction, that is, the agitation or shaking, but is referable to the immediate cause of the spasms.

Annales d'Oculistique, July, 1871—Dec. 1872.

Strabismus.—Dr. JAVAL continues his article, to be published we trust in the form of a monograph when finished.

La Séreuse Intra-Oculaire et la Nature du Glaucôme. Dr. A. SICHEL. He thinks Schwalbe's anatomical examinations and discovery of a true lymphatic sac, admit the recognition of an intra-ocular arachnoid from whence comes the hypersecretion Graefe alleged was the cause of glaucoma. The various symptoms of glaucoma and the effects of iridectomy are in this light ingeniously explained.

Criticisms on Burckhardt's "International Tests for Vision."—Dr. FURST; who says the tests were devised to avoid the inconveniences attached to letters, and for the purpose of determining S. R. and A. without the aid of glasses. But he concludes that in general, the usual tests are better. Moreover these tests of Burckhardt do not exclude the use of glasses to determine S. and R. with II., As. and M. $> \frac{1}{6}$, and in simulated M. atropine must be used; so also to examine N. and A. glasses are necessary. As to astigmatism, Furst says, Burckhardt's method will readily lead to mistake in reference to the meridian of greatest curvature. The determination of the degree of As. by glasses is sufficiently exact, this exactitude varying greatly, according to different degrees of astigmatism.

Albuminuric Retinitis. Dr. A. ROBERTSON, who concludes: 1st. That trouble with vision frequently accompanies chronic Bright's disease. But if in some cases this may be attributed to uræmic poisoning, in the greater number it is due to inflammation of the retina, complicated with fatty degeneration. 2d. The retinal alteration is so marked that the ophthalmoscope definitely determines it. 3d. The retinal trouble is most often associated with the form of Bright's disease, in which there is shrinking of the kidneys; but it also accompanies the amyloid variety. 4th. It is not rare that from the insidious progress of the principal affection, the ocular symptoms are the first which force the patient to seek the aid of science. So that the ophthalmoscope often seems to diagnosticate a pathological alteration not even suspected. 5th. In a few cases the retinal trouble has disappeared and its functions been reëstablished.

Extraction of Cataract without Opening the Capsule. Dr. H. PAGENSTECHER.—Its advantages he holds are the following:—Extraction of the lens with its capsule removes all predisposition to inflammatory process on the part of the iris. In 200 cases he had not a single primary iritis. The operation excludes any secondary one. Visual

acuteness is greater after this than after any other operation. In twelve per cent. it was normal. Whilst it has these advantages, it however has the risk of total loss, which linear extraction also has. The defects of the method are the difficulty of operating, and of being sure of the diagnosis in certain cases. As vitreous is frequently lost during the operation, this substance must necessarily get between the lips of the wound and retard healing. No ill effects have been seen from such prolapse.

Extraction of Cataract. Dr. MAZZEI, of Florence, in a letter published in the *Annales*, speaks of the method he was taught by Magni and his modification. His knife is twenty-four millimetres long and three broad, varying somewhat from Græfe's. The patient lies down with the other eye bandaged. An assistant fixes the upper lid, being warned not to draw it up too strongly. The eyeball is steadied by the index and middle finger of the right or left hand, according to the eye operated on. The knife is entered in the sclerotic at the lower third of the external periphery of the sclero-corneal junction, care being taken to direct its point towards the centre of the pupil, i. e. at an angle of 40° , with the inferior corneal tangent. The knife is then pushed in this direction to its greatest width, which is about three millimetres. This done, the direction is changed to one parallel with the lower horizontal tangent of the cornea, and the knife carried across to a point opposite the one of entrance, the cutting edge being always directed downwards. Then this is turned forward at an angle of 45° – 50° , and the incision completed by a gently sawing movement. The capsule is then opened and the extraction of the cataract facilitated in the usual way, i. e. by exercising slight pressure with the curette below the wound, and by pressure in the right direction from the thumb of the other hand. The patients act much better during this third stop of the operation, since they are not troubled by the speculum or fixation forceps.

Absence of the speculum, fixation forceps, and iridectomy are what the author therefore claims, give: 1st. A simplified operation. 2d. Almost perfect preservation of the iris. 3d. Less pain and discomfort for the patient, relieved of the mechanical dilatation of the eyelids.

The Distance from the Fovea Centralis to the Centre of the Blind-spot. Dr. DOBROWOLSKY.—He finds that the distance between the macula and the papilla varies in emmetropic eyes, between 3.915 and 5.467 mm. In slight hypermetropes this distance is greater than in emmetropes. In slight myopes the distance varies but very little from emmetropes. It decreases with increased myopic, but in no regular progression.

Phlebitic Ophthalmitis. Dr. WORLAMONT.—An interesting case ending fatally.

Prof. Stœber's introductory remarks on the cure of diseases of the eye and the practice of the specialty are given in the November and December Numbers of the *Annales*, 1871.

Annales d'Oculistique, 1872, opens with a very interesting and pleasantly written eulogy of Græfe, accompanied by an alphabetical table of all that was written and published by the master in ophthalmology.

A Demonstrating Ophthalmoscope for two Observers. A. SICHEL.—The edge of a prism partly covers over the hole in the ophthalmoscope, and

reflects off at a right angle the image to the second observer's eye. It may be used as a hand instrument or set up on a stand.

A Moveable Prism. CRETES, Optician.—Two equal prisms when base to base form one of double the power, when base to apex they neutralize each other. As they are turned from one to the other position they form prisms of all the several degrees. Crêtès has thus arranged two prisms in a collar with a handle on which a scale with indicator tells us what angle we are using.

A Double Forceps to hold the Globe during Operations. MONOYER.—This possibly may be very handy when the ocular muscles are entirely relaxed under ether. I judge it would be much better than the fixation forceps invented by Jäger. The teeth look, however, rather formidable for old conjunctivæ.

Corelysis. Dr. WECKER.—He seems mistaken in the idea that Passavant's operation was intended for anterior synechiæ as well as posterior. His lack of success would seem dependent on too large a corneal wound and using *toothed* forceps instead of the perfectly smooth ones necessary.

Tattooing the Cornea. WECKER.—He has done this more than twenty times with Chinese India ink. Warlomont adds in a note that he has done it twice with very satisfactory success. As of course have many others.

Circumscribed Choroiditis. Dr. A. SICHEL.—The particular characteristic of the affection he treats of, is "the presence in a limited portion of the fundus of an alteration analogous to what is seen in choroiditis disseminata or areolaris." He proceeds to show that there are four periods corresponding to four stages of alterations seen. 1st. A period of hyperæmia and local congestion. 2d. A period of exudation and fatty proliferation. 3d. A period of regression or pigmentation. 4th. A period of atrophy. His treatment is local bleeding by Heurteloupe's leech, followed by 24 to 36 hours of total darkness. Frictions on various parts of the body with Neapolitan ointment. Internally, syrup of Gibert. On the temple and forehead a series of three to five small blisters. The details of five cases are given.

Wecker's Clinique at Paris.—In the report given by Martin, here in the Annales, we find there were ninety-five cataracts operated on. In speaking of these, a new form of cystitome forceps are highly recommended. His results of vision measured in $4 = V = \frac{20}{20}$

"	"	"	10	=	"	=	$\frac{20}{5}$
"	"	"	18	=	"	=	$\frac{1}{3}$
"	"	"	26	=	"	=	$\frac{2}{5}$
"	"	"	10	=	"	=	$\frac{2}{7}$
"	"	"	4	=	"	=	$\frac{1}{5}$
"	"	"	5	=	"	=	$\frac{1}{10}$

Sixty-one iridectomies were done for various causes, always with a Græfe's knife, with which as small an iridectomy as is needed can be made. For convergent squint, the right internal tendon was cut 17, the left, 19 times. The external right, 3, the left, 2 times. A right and left muscle were each advanced by means of the diagonal suture.

Seven times sclerotomy was successfully practised for glaucoma, nevertheless doubt is expressed as to its replacing iridectomy. Sæmisch's operation for corneal ulcer was done three times without success. The cornea was tattooed eight times, with four to six sittings

for each patient. Peridectomy was six times employed; the cases were too recent to draw conclusions from.

Herpes Zoster. Dr. HUBSCH.—This case was diagnosticated by Prof. Hebra, of Vienna, as "chronic herpes zoster." There was resultant, white atrophy of both optic papillæ and furious delirium, with signs of diffuse encephalitis. A most interesting and instructive case.

Foreign Body of some Size in the Orbit. Dr. BOREL.—The amber mouth-piece of a cigar-holder was forced into the orbit, and removed ten days afterwards without injury to the eye.

Epithelioma of the Iris. Dr. MONOYER.—A double epithelioma *perlé* or *margaritoïde* of the iris following wound of the eye. Removal of the larger of the two tumors. Panophthalmitis. Histological examination of the morbid growth.

Review of Foreign Ophthalmological Literature. Dr. WOINOW.—He sketches a number of articles in the Russian language. We can only give the list here:—

Material to define the limits of the field of vision. Dr. M. Reich.

Influence of the central sympathetic nerve on the nutrition of the eye. Sinitzin.

Critical review of the theories as to the formation of pterygia. Dr. Storogeff.

Physiology of the lachrymal passages and the secretion of the tears. Dr. Dentschenxo.

Effect of general bleeding on traumatic inflammation of the cornea. Dr. Rubaschkin.

On some subjective manifestations of vision. Dr. Dmitrowsky.

Paralysis of the ocular nerves due to "tabes dorsalis." Dr. Woinow.

Transitory Amaurosis. Ditto.

Vessels of the choroid and optic nerve; lamina cribrosa. Dr. Wolhfring.

Determination of the relative force of the external ocular muscles. Dr. Krükoff.

Development of the lens capsule. Dr. Zernoff.

Astigmatism in patients after cataract operation. Dr. Woinow.

Strychnine in amblyopia. Dr. Woinow.

Formation of cataract depending on nervous troubles. Dr. Logetsnikoff.

Myopia in students. Dr. Maklakoff.

Cysticercus of the retina. Dr. Lagetschinoff.

Exceptional physiological excavation of the optic papilla. Dr. Maklakoff.

Souvenirs of the Ophthalmological Congress at London, 1872.—Dr. WARLDMONT devotes thirty pleasantly written pages to describe what he saw and heard, and his general impressions of the Congress. I do not quote them here, as the regular report of the Congress will appear in due time, and I have already given a list of the papers read, &c.

Transit of Venus over the Sun. GIRAUD TEULON.—If any one of my readers is surprised at such a title in an ophthalmic review, let them read the author's twenty pages on this subject and they will see that the ophthalmic surgeon must needs be a physicist also.

Cutaneous Grafting in Ophthalmic Surgery. Dr. WECKER.—He says

his own method may always be employed. 1st. In cases of burns of the lids or neighborhood, which have caused suppurating wounds whose faulty cicatrization threatens deformity or displacement of the lids. 2d. In partial or total ectropion, caused by cicatricial contraction in the neighborhood (burns, caries, fractures). 3d. It may replace with advantage most if not all the methods of blepharoplasty. 4th. It should be used always where, from operation or accident, there has been a considerable loss of the substance of the lids.

Introduction of the Metrical System in Numbering Glasses, and the Choice of the Unit of Refraction. Dr. MONOYER.—He criticizes the Committee's report made through Javal, at the London Congress, and concludes: 1st. That the unit of refraction proposed by Javal is contrary to the principle of the metrical system. It cannot be introduced except by forcing the manufacturers to make twenty-eight new glasses, or resigning ourselves meantime to commit no inconsiderable mistakes. The unit in question (a glass of 240 centimetres) is too small for practical necessities. 2d. The metrical unit of refraction, as is represented by a glass of one hundred centimetres focal distance, alone conforms to the metrical system. It suffices for practical purposes, and allows, moreover, of a precision to suit ourselves. It may be used without recourse to new glasses, if we use a combination of glasses, and errors will be less than 0.1., namely, corresponding to a glass of ten metres focal distance. We can also avoid combining glasses by making twenty-three instead of twenty-seven new glasses.

Ophthalmic Surgery of the Ancients. Dr. ANAGNOSTAKIS.—A continuation of previous articles of March and April No., 1870. He finds that all our modern operations were performed by the ancients; to such an extent, that we await the description or discovery of an ancient ophthalmoscope.

Strychnine in Ophthalmic Practice. Dr. GORI.—The objections to the subcutaneous injections of strychnine have induced him to use, and, as he reports, with the same success, a mixture rubbed in around the orbit and temple, consisting of Tincture Iodine, grammes four; Nitrate of Strychnine, centigrammes two.

The Trephine and its Application. Dr. WECKER.—This should be read in connection with Bowman's remarks at the London Congress.

Cysticercus in the Vitreous. Dr. HIRSCHBERG.—The patient could hardly count fingers at one foot distance. Two months after he extracted the parasite the patient counted fingers at four or five feet, and with convex two-inch focus glass, read Jäger, No. 18.

Royal London Ophthalmic Hosp. Reports. Vol. vii., Part 2.

Pathological and Anatomical Researches on the Inflammatory Changes occurring in the Intraocular Terminations of the Optic Nerves, as a consequence of Cerebral Disease. Dr. PAGENSTECHER.—He gives the results of his investigations carried on in Dr. Bader's laboratory in London, aided by Dr. Hughlings Jackson's material. I cannot properly quote from his paper here. It is quite long, extremely interesting, and well illustrated.

Long Persistent Diphtheritic Conjunctivitis following Measles. Loss of both Eyes. Scarlet Fever occurring during the Course of Disease. F. MASON.

Statistical Details of Four Years Experience in respect to the form of Amaurosis, supposed to be due to Tobacco. Mr. HUTCHINSON.—He says: "Now the lesser of these facts seems to me to support the opinion I have long held, that when tobacco causes blindness, it does so in virtue of an idiosyncrasy. It is by no means improbable that such idiosyncrasy will be found occasionally in several members of the same family, and further that it may involve liability to suffer from other influences besides tobacco smoking. Those who suffer most are smokers of *shag* tobacco. Almost invariably complete disuse insures improvement of vision. Immediate and complete abstinence in the early stages of this most serious malady is absolutely necessary. Many patients came too late. In the early stages blindness has not followed if the patient had strength of will to give up the habit."

Selected Cases from Ophthalmic Practice. I. S. JEAFFRESON.—Congenital malposition of the lens in each eye. Erectile tumor in the orbit. Absolute amaurosis with loss of taste and smell. Double glioma of the retinae, no operation. Foreign body lodged in the orbit. Curious case of traumatic cataract. Foreign body in the eye. Detachment and extrusion of the lens and iris following a rupture of the eyeball, good vision remaining.

Pathological Report of the Curator. Mr. NETTLESHIP.—An extremely interesting series of cases. He gives in addition—

A New Method of Preserving and Mounting Eyes for Examination by the Naked Eye or by low powers of the Microscope.—The details of preparation I will not give here. The preserving fluid is made by mixing equal volumes of pure glycerine and the palest calves-feet jelly; latterly, for precaution's sake, he has added one volume of creasote to each five hundred volumes of the jelly.

Periscope of Contemporary Ophthalmic Literature.—Some 35 pages, principally culled from the *Annales d'Oculistique*, vol. vii., part 3, July, 1872.

A Cancerous Tumor originating in an Eye which had been long lost from some Inflammatory Affection. Mr. LAWSON.—A very interesting case, the globe and tumor having been carefully examined by Mr. Nettleship. The author truly says: "It shows that one of the evils which may arise from a lost eye which is undergoing degenerative changes, is that it may become the seat of malignant deposit. It is true that instances of cancerous growths, originating in old lost eyes, are comparatively rare, yet they occur with sufficient frequency to show that the structural metamorphosis which usually, after a time, takes place in eyes which have been destroyed by accident or disease, is favorable for the production of cancer."

A Report on the forms of Eye-disease which occur in connection with Rheumatism and Gout. Mr. HUTCHINSON, who says, with truth, "Rheumatic iritis is a disease which, in this age of specialisms, is very apt to be pushed to the wall. It is nobody's child. Dr. A., writing on rheumatism, does not mention the eye, and Mr. B., writing on the eye, dismisses rheumatism with contemptuous brevity. Yet an attack of this form of disease is not pleasant to bear, and many a patient would thank his surgeon if he had any efficient plan for its relief, and still more if he could say anything as to its prevention." We can only advise our readers to study Mr. Hutchinson's forty-five pages, and they will be in better condition to carry out what the last sentence, I quote from him, speaks of.

New Strabismus Hook. Mr. COWELL.—Figured. Made by Weiss, 62 Strand.

Test Types. Mr. COWELL.—Printed and for sale by T. Brettell, 51 Rupert St., Haymarket.

Inflammation of Uveal Tract, occurring in a Father and three Sons. Mr. COWELL.—The right eye was primarily affected in all. The left eye subsequently attacked in two. In four eyes the lens was cataractous. Probably syphilitic. Mother the subject of congenital cataract.

On Œdema, or Cystic Disease, of the Retina. Mr. NETTLESHIP—who says, “The pathological condition to which the following remarks apply, has been already fully and accurately described by Dr. Iwanoff, under the title, first, of ‘Colloid Cystic Disease of the Retina,’ and, secondly, of ‘Œdema of the Retina;’ and a figure of the latter condition is given by him in the Archiv f. Ophth. It was also described and figured by Dr. R. Blessig, in a pamphlet on the minute structure of the retina; he regarded it, however, as the normal condition of the retina between the equator and the ora serrata.” Now Mr. Nettleship, from his histological observations which he describes and figures, concludes, “In whatever manner, then, peculiar changes are brought about in the retina, whether by a morbid process starting in that structure, or as the result of changes in the choroid and sclerotic, the term Œdema seems to me inadequate. The features which, above all others, strike attention are the elongation and thickening of the bundles of Müller’s fibres, and the atrophy of the nerve cells and fibres. “Cystic disease” is less misleading, although the meaning commonly attached to the word does not bring to mind the appearances observed in any way, excepting the most highly developed specimens of the disease under consideration. It is, however, not easy to find any one word which will fairly express the essential conditions of this morbid state, and for the present, therefore, it will probably be better not to disturb the received nomenclature by suggesting any other name.”

Curator’s Pathological Report. Mr. NETTLESHIP.—A very admirable and interesting account of the most important and interesting eyes removed at Moorfields, between July and Dec., 1871. It repays the reading.

Periscope of Contemporary Ophthalmic Literature.—Thirty-five pages of culled material, somewhat similar to this report here made.

Archives of Ophthalmology and Otology. Vol. ii., No. 2, 1872.

This is an admirable number. As it is in English and within the reach of all, from Wood in New York, I do not consider it necessary to sketch the articles it contains. The ophthalmic papers it contains are the following ones.

Anomalous Circulation in the Eye.—Dr. E. G. LORING, with colored plate.

Cysticercus Intraocularis. Sarcoma of the lower Eyelid. Glioma Retinæ in the first Stage. Glioma Retinæ, with plates. Dr. HIRSCHBERG. Translated by Dr. C. C. Terry.—Besides these, Hirschberg contributes through the same translator:

Engorged Papilla in consequence of solitary Tubercle in the Cerebellum; Contribution to the Pathology of Glioma Retinæ.

Contributions to Ophthalmo-tonometry.—Dr. E. PFLÜGER, by Dr. E. Guening.

Notes on Ophthalmological Subjects made during a journey through Europe. Dr. H. KNAPP, one of the Journal Editors.—Extremely interesting.

Tearstone in the Canaliculus Lachrymalis inferior. Dr. PAGENSTECHEK.—Translated by Dr. Charles J. Kipp.

Tattooing of the Cornea. WECKER.—Translated by Dr. T. R. Pooley.

Galvanic Treatment of Diseases of the Eye and Ear. Prof. ERB.—Translated by Dr. H. C. Scott.

Fibroma of the Sclerotic. Prof. SAEMISCH.—Translated by Dr. C. C. Terry.

Annali d'Oftalmologia. Prof. QUAGLINO.—Milan. Nos. 1 and 2, 1871.

Myxoma of the Optic Nerve. Dr. MANFREDI.—This is the report on the tumor extirpated and reported on by Quaglino in *Ann. d'Oculist.*, May, June, 1871.

One Hundred and Twenty Peripheric Linear Cataract Operations. Dr. SECONDI.—He reports 103 good results, 7 medium, and 10 lost.

Congenital Coloboma of the Iris. Dr. PONTI.—One of his own children, 7 years old. He reports on 64 cases, and gives their descriptions and complications.

Traumatic Anesthesia of the Retina. Prof. SECONDI.—He considers it a distinct trouble, from: 1st. Complete absence of any recognizable ophthalmoscopic lesion. 2d. Absence of scotoma or breaks in the visual field (ordinary symptoms of rupture of the choroid or retina). 3d. Absence of any cerebral symptom, or signs of inflammation or consecutive atrophy of the optic nerve (the necessary results of fracture of the cranium, hæmorrhage or exudation affecting the branches or the course of the nerve). 4th. The frequency of cures; the rapid action of electricity and strychnine.

The Electric Current in the Treatment of Conjunctivitis. Dr. CADEI, who repeated the experiments of Rodolfi, reported in the *Annales*, Sept., Oct., 1871, p. 173.—He considers the price of the apparatus, its complexity and its method of use, as well as the loss of time, more than balance the meagre results obtained.

Experimental Study of Inflammation of the Crystalline. Dr. C. FORLANINI.—Illustrated with microscopic drawings. He concludes: 1st. That the lens may suppurate. 2d. To produce this some irritating cause must exist within it. 3d. Yet a foreign body may remain a long time in the lens without sensibly interfering with its nourishment. 4th. The suppuration is always limited to a certain portion of the cortical regions; the nucleus never suppurates. 5th. The pus globules may arise from the epithelial cells by transformation of their nuclei, which may exceptionally multiply. 6th. The pus appears in the lens fibres by endogenous formation. The nuclei of the fibres never multiply, but have probably a limited share in pyogenesis, like the epithelial nuclei. 7th. Cohnheim's theory does not hold for the crystalline; leucocytes never pass through the intact capsule. Penetration of pus from the exterior is always accidental. 8th. Whenever the lens becomes fluid, the cause is accidental penetration of pus from outside. Becker's canals do not exist any more than an interfibrillar circulation in phakitis.

Two Cases of Dislocation of the Lens. Dr. N. MANFREDI.—A contribution to the theory of accommodation. The results support Helm-

holz's idea of the mechanism of accommodation by relaxation of the zonula.

Is Iridectomy indispensable for the Cure of Glaucoma.—Prof. QUAGLINO, who makes instead an incision in the sclerotic. This he is inclined to follow up. He publishes (not to substitute sclerotomy for iridectomy for the treatment of glaucoma), but to remove the veil of scientific mystery thus far surrounding this operation, and prove that it is not the excision of a piece of the iris which changes the conditions of the glaucomatous eye, but the relieving the sclerotic by the incision.

The Perimeter and its Application.—Dr. E. LANDOLT.

Blepharospasm. QUAGLINO.—Convulsive in both eyes, cured by the subcutaneous section of the supra-orbital branch of the trigeminal nerve.

Injection of Calomel in Syphilis. MAGRI.—Some new cases of specific iritis thus treated, as also by Prof. Quaglino.

Reply to Prof. Schmidt and Flarer in the 2d and 3d Nos. of this Journal.—Dr. C. FORLANINI, who reports new observations and experiments.

Journal d'Ophthalmologie, 1872, Jan.—Dec.—Drs. GALEZOWSKI and PIECHAND.

This is a new French ophthalmic journal, whose editors well say, that it is strange no special one has been published in Paris, one of the great medical centres of the world, whilst England, Germany, Italy, Belgium and the United States, each have their representative journal. This French journal is to appear once a month, of some sixty pages. Wood cuts are quite freely used in the number for January. The journal has stopped at the end of its first year, 1872. It opens with a series of clinical observations, as follows:

Perineuritis Optica Double. Retinal apoplexies probably due to malarial fever. Cure by sulphate of quinine.—Dr. GUENEAU DE MUSSY.

Sympathetic Choroiditis.—Prof. GOSSELIN's lecture at la Charité, illustrated with a wood cut.

Keratoconus treated by Græfe's method.—Dr. LAWRENCE, of Bahia.

Traumatic Strabismus accompanied by very disturbing diplopia, cured, and binocular vision restored, by tenotomy of the rectus externus.—Dr. ABADIE.

Irregular Astigmatism of the cornea causing trouble of refraction and thus simulating hemeralopia.—Dr. ABADIE.

Polypi developed in the lachrymal canals.—Dr. PAUL.

Separation of the Retina treated by fastening this membrane into a cut in the sclerotic. Dr. GALEZOWSKI.—Illustrated by a wood cut. He made an incision with Græfe's knife in the sclerotic a centimetre behind the corneal border. The cut was three to four millimetres. "Through this I introduced Desmarre's forceps into the middle of the vitreous and sought to grasp the floating retina which could be distinctly seen through the dilated pupil. After a few ineffectual efforts I succeeded in seizing it and drawing it into the wound where I kept it fixed. At once it could be seen that the floating membrane no longer existed in the vitreous. The patient said they saw some red lights in the eye; no pain. After the operation, strict diet, perfect

quiet and cold compresses, with atropine collyria. The sequelæ of the operation were very simple. The eye, though red, was not much inflamed. The portion of retina fastened in the wound inflamed, but the cut could scarcely be seen in fifteen days. Ten days after the operation we examined the eye with the ophthalmoscope, and could see the papilla much more distinctly; the separation on the inner side was changed to a grayish white exudation. On the outer side the floating retina could be still seen, but over a very small extent. The patient saw much better, could go alone, and distinguished No. 30 of the test type, which he could not previously do. Examination showed the visual field to have gained in extent. The improved condition lasted as long as he stayed in Paris, i. e., a month. This certainly was as satisfactory a result as could be expected in a man two thirds of whose retina was separated. The operation seems preferable to all others, as it leaves the retina attached to the choroid after the fluid has escaped through the wound."

Acute Serous Choroiditis. Prof. RICHET.—It followed a chronic inflammation of the cornea and sclerotic. There was considerable increase of the globe in volume and intraocular pressure, which was greatly reduced by iridectomy.

Astigmatism. Dr. MAURICE PERRIN.—Illustrated.

Hypermetropic Convergent Strabismus.—Dr. CUIGUET.

Atrophies of the Papilla and Optic Nerve and their Etiology.—GALEZOWSKI.—In the first part there is a synoptical table of atrophies of the papilla by Prof. Vulpian. Galezowski concludes that we may arrest atrophy in a certain number of cases. Aside from cerebral and cerebro-spinal affections, which he hopes later to study, he thinks: 1st. In traumatic atrophy, if sight is not wholly lost after the accident, we may use with advantage for the first six or eight months derivatives of all kinds. If the disease has lasted several years, we may apply the constant current and exercise the eyes with convex glasses. 2d. Syphilitic atrophy of the papilla is very serious, and rarely arrested by any internal treatment. In two cases it was arrested by mercurial inunctions. 3d. Suppressed menstruation must be restored, and hemorrhoids attended to. 4th. If the atrophy is dependent on intermittent, anti-periodics and change of climate are in place. 5th. Alcoholic atrophy must be treated by total abstinence from alcohol, coffee and liqueurs. Preparations of bromide of potash, calabar bean or opium, internally or locally, are employed with benefit. 6th. The digestive tube must be carefully looked after, and everything attended to that may have an immediate or remote effect on the disease. Emetics here do good service.

Osteo-Periostitis of the Malar Bone. RICHET.—This included the inferior wall of the orbit. The abscess opened spontaneously, leaving a cicatricial ectropium of the lower lid remedied by a plastic operation.

Convulsive Facial Neuralgia. ABADIE.—Glaucoma followed, having its point of departure in a peripheric morbid zone. Complete relief to the pain and convulsions was obtained by section of the infra-orbital nerve.

Extraction of Cataract. PIECHAUD.—Complicated by loss of vitreous. The patient held quite still during the first operation, but during the second resisted and caused loss of vitreous. Eye was finally saved.

Traumatic Cataracts. TRELAT.—A lecture at La Pitié.

The Region of the Macula and its Circulation. DELORME.—He gives eight figures of the ophthalmoscopic picture as he has seen it, and concludes that, "far from being completely deprived of vessels, as *a priori* we should judge physiologically, the region of the macula is the portion of the fundus where by the ophthalmoscope we may see the largest number of venous and arterial branches terminating."

Pigment Collections at the Macula. DELORME.—These he believed to be due to "an old proliferation of the cells of the epithelial layer of the choroid."

The same author gives also a picture and describes what he saw in—

The Region of the Macula in a Case of Non-inflammatory Chronic Glaucoma.

New Method of treating Ocular Affections by Vapor. LOURENCO.—Vapor of water or medicated water is allowed to stream against the eye.

Paralysis of the Third Pair. MUSSY.—The case ended fatally. There was apparently no post-mortem. The supposed cause was an aneurism of some one of the cerebral arteries.

Affections of the Tear Passages. GALEZOWSKI.—Supernumerary puncta. Injuries of the nasal canal. Treatment of lachrymal tumors.

Amblyopia. Dr. DIEN.—Caused by masturbation in a boy five years old, who had congenital phimosis, relief of which apparently cured the amblyopia.

Pathology of the Constrictions of the Nasal Canal.—ABADIE.

Differential Diagnosis between Atrophic and Exudative Choroiditis.—CUIGNET.

Alterations at the Yellow Spot. SALIVAS.—He speaks of various alterations due to hæmorrhage, fatty degeneration, exudations, syphilitic retinitis, and atrophic choroiditis.

The Irregular forms of Glaucoma and their Complications. GALEZOWSKI.—This is commenced in the April number and continued in May and following numbers.

Nystagmus from Insufficiency of the External Recti Muscles.—FAUCON.

On some forms of Tumors of the Lids and Conjunctiva.—GALEZOWSKI. Gummous tumor of lid. Plaques muqueuses on the free edge of the lids. Syphilitic ulcerating tubercle at external commissure of lids.

Curative effect of Iridectomy in Opacities of the Cornea.—PAUCHON.

Tearing out a Portion or Whole of the Iris. Dr. CUIGNET.—The author's cases would show that such operative interference is not so dangerous and does not cause the trouble we should have anticipated. In fact when needed it may be done.

Ectropion of the Lower Lid. Dr. A. RUAUX.—Following necrosis of the superior maxillary and malar bones.

Syphilitic Iritis. M. LONGUET in the service of M. GOSSELIN.—Complete loss of vision of the same side.

History of a Retinitis. Dr. CHIBRET.—Observed in himself and described in a letter addressed to the editor of the Journal, Dr. Galezowski.

Arrest of Development of the Retina. Dr. GAYDA.—Persistence of retinal folds.

Dermoid Cyst. Prof. RICHET.—Occupying the inner angle of the right eye.

Conditions affecting the Amount of Parrallactic Displacement of the Ophthalmoscopic Image.—Dr. ABADIE.

Cerebral Right Homonymous Hemipopia. Double Optic Neuritis following Injury of the Frontal Bone from a Fragment of a Shell.—GALEZOWSKI.

A Variety of Congenital Amaurosis not yet described.—GALEZOWSKI.

Foreign Body Encysted in the Iris.—Dr. BASTIDE.

Epidemic Hemeralopia in reference to Simulation.—Dr. A. FANCON.

On Enucleation of the Eye.—Dr. MANCHE

Functional Abstractive Squint. Hyperopic Astigmatism.—Dr. MIARD.

Incomplete Right Hemiplegia—Paralysis almost complete of Third Pair Left.—Dr. BONCOUR.

Double Optic Perineuritis.—DITTO.

Diabetic Amblyopia.—Dr. PIECHAUD.

Frontal Zona, and of Scalp. Dr. TARDY.—Giving rise to trouble of vision; consecutive anæsthesia, ptosis, cure.

Paralysis of Left Inferior Oblique.—Dr. CUIGNET.

A Special Variety of Intestinal Keratitis and its Treatment.—Dr. DAGUENET.

A new Cystitome and its Use.—Dr. LORENCO.

Is there any Accommodative Power in Aphakia?—Dr. ABADIE.

A new form of Forceps to use in Enlarging the Palpebral Aperture.—Dr. J. LORENCO.

On some Observed Cases of Syphilitic Iritis.—Dr. A. PIECHAUD.

An Experiment proving the Possibility of Relaxing and Suspending at Will the Arterial Circulation in one's own Retina, and the Value of this Experiment.—Dr. BARETY.

Alcoholic Amblyopia. Dr. APOSTALI.—The symptoms, differential diagnosis, prognosis and treatment are given.

Ocular Affections of Syphilitic Origin. Dr. FOURNIER.—Atropine and mercury.

Diplopia pathognomic of Paralysis of the Sixth Pair. Dr. CUIGNET.—He concludes that our ordinary tests for paralysis of the 6th may fail. 1st. When there is but slight feebleness, as then the images may approach each other and even fuse, preventing the patient from appreciating their relative difference in height. Now it is in the positions downwards that the image is highest, half the indicative sign. 2d. When the feebleness is quite pronounced, in some persons with small palpebral apertures, images near each other upwards exhibit no difference in height. 3d. When the paralysis is in process of recovery, difference in height disappears, especially upwards. 4th. As soon as this sign alternates, it loses its simplicity and primary evidence, requiring a very delicate and careful analysis to recognize the paralysis.

The best Method of Extracting Cataract. Dr. MANCHE.—This he says is Liebreich's method, which he has used with success. But precisely what we want to know, namely, his results, he does not give.

The Irregular Forms of Glaucoma.—Dr. GALEZOWSKI concludes his extended article with the following conclusions. 1st. Hæmorrhagic glaucoma is an irregular form of the disease, nearly always resisting all treatment. If after iridectomy, the neuralgia and inflammation persist, we often must needs enucleate the globe to protect the other eye liable to a similar accident. 2d. We should perform iridectomy for glaucoma on both eyes at the same time, if the second shows prodromous symptoms. 3d. Iridectomy should be practised in acute or chronic glaucoma, even if vision is forever lost. It will prevent

consecutive accidents. 4th. In simple glaucoma, incision of the iris is often sufficient, provided its inner portion is cut.

Blepharoplasty.—Dr. DUPLAY.

Blepharo-phimosis.—Dr. CUSCO.

Paralytic Squint Operation.—Dr. PANAS.

Perforating Ulcer with Keratitis, Hernia Iris.—Dr. GOSSELIN.

Tubercles of the Choroid.—Dr. PASQUIER.

Ulcerative Keratitis produced by Arsenical Powder.—Dr. PIECHAUD.

A Case of Pellagra. Dr. TARDY.—Some ocular troubles following it.

Cases of Syphilitic Affections of the Eye. Dr. BONCOUR.—Cornea, iris and nerve.

Keratitis Treated by Vapor Douche. Dr. BONCOUR.—Records of various forms.

Affections of the Eye associated with Beriberi. Dr. LORENCO, Bahia, Brazil.—This is a paralytic disease, and the ophthalmic trouble takes the form of optic atrophy.

Separation of the Retina Treated by Iridectomy. Dr. GALEZOWSKI.—He says, "These three observations prove the great value of iridectomy in separation of the retina. The duration of the benefit, time has not yet decided." He adds, "Separation of the retina is only one of the varieties of the glaucomatous affections, and just as in these iridectomy acts so wonderfully in checking the disease, so in separation of the retina, the operation, when used in time, arrests the progress of the trouble, and often restores vision in great part."

Ophthalmoscopic View of the Circulation in the Eye.—Dr. CUIGNET.

Oculo-dental Affections. Dr. GALEZOWSKI.—Not finished, and the journal stopped.

Hydatids. Dr. VERDALLE.—Developed in frontal sinus and orbit. Incision, evacuation of hydatids. Cure.

Neuralgia, Fifth Pair. Dr. GILETTE.—Anæsthetic troubles in the face, and very serious troubles of nutrition of the organs of sense.

On the Use of the Ophthalmoscope in Diseases of the Nervous System and of the Kidneys; also in certain other General Disorders. By THOMAS CLIFFORD ALLBUTT, M.A., M.D. Cantab. London and New York: Macmillan & Co. 1871.—The author in his preface says, that "some considerable parts of the present volume have already been published in the various medical journals and society transactions, but little or nothing has been transferred to this book as it stood. Large portions have been re-written in order to add the results of more experience and to express maturer opinions." He thought it better "to exercise much reserve in printing his accumulated material, and to publish his own conclusions, with a few illustrative cases only, rather than to print a mass of such evidence as may be collected for himself by any practitioner who is interested in the subject." Still he has given us a book of 400 pages, about which and what is in it we desire here to say something. The author has from his various articles been pretty well known to the profession in this special branch of study, so that what he would have to say in a book would naturally be eagerly read and due deference paid to it. To those who have not known or heard of him, we would say that Dr. Allbutt some time ago was wise enough to see that he himself must master the ophthalmos-

cope and not be dependent on any ophthalmic surgeon for a report of the condition of the optic nerve entrance or retina in the cases his practice brought before him. We wish we could here quote his whole introductory chapter to show the spirit in which he went to work and in which he has prosecuted his studies and given us their results. This chapter, of some ten pages only, might well be quoted entire by medical journals for the benefit of their readers. Following this introductory chapter comes the book itself. He prefaces with explanations of the use of the ophthalmoscope, and how he manages it in special cases; then he explains the aspect, structure and connections of the normal optic nerve and retina. Next its variations from health in hyperæmia, anæmia of the disk and retina, œdema of the disk, ischæmia of the disks (choked disks), neuro-retinitis, chronic optic neuritis, retinitis, perineuritis, consecutive atrophy, primary atrophy. Now follows the relations between certain intracranial disorders and affections of the optic nerve and retina, in epilepsy, chorea, mania, dementia, meningitis (tubercular, pyæmia and fevers, syphilitic and rheumatic, of drunkards, traumatic), concussion and fracture, hydrocephalus, tumors and periostitis chronica, atheroma, softening and hæmorrhage, cerebritis, abscess and sclerosis, general paralysis.

Chapter VI., the next, is on the ophthalmoscopic signs of disease of the spine; then follow other chapters on the retinitis associated with albuminuria, leukæmic retinitis, on the amaurosis of diabetes, tonic amaurosis from alcohol poisoning, tobacco amaurosis, lead poisoning, hypnosis and narcosis, embolism of the central artery of the retina and its branches. The appendix sketches 123 cases illustrative of the text of the several chapters, and constantly referred to throughout the book.

Following this, we have a tabular view of 43 cases of *insanity with epilepsy*, in which the optic nerve and retina were seen and their appearances recorded; another, of 51 cases of *mania*; another, of 38 cases of *dementia*; another, of 17 cases of *melancholia* and *monomania*; another, of 12 of *idiocy*; another, of 53 cases of *general paralysis*.

By perusal of the foregoing the reader of this notice will have obtained some idea of what the book treats of, but only a personal perusal of the book itself can give him any idea of the admirable manner and most excellent spirit in which it is written; the research in and fairness towards all foreign literature; the cautious deductions and modestly given conclusions of the author, and not least his ready and repeated acknowledgments of others' works, whether quoted from or not. The faults of the book we do not desire to dwell on here, since there are so many other places for criticism open to those who desire to attempt it. We simply wish to call the notice of the profession to this admirable work, written in the true spirit of investigation. It is not a book for specialists, nor written for the ophthalmic surgeon. It is written for, and should be read by the general practitioner, who has to deal with the diseases here discussed, and now explained by the light of the ophthalmoscope. It will be, however, very welcome to all of us specialists, since we are, and must apparently for a long time be expected to report upon what we see in many of the above mentioned diseases, and thus help out the general practitioner in his diagnosis, precisely as we in our turn must apply to the

special chemist to obtain a minute analysis of the urine or blood. To both the general practitioner and specialist the book is also very valuable, as it gives us both, in a certain sense, a common language. For instance, a patient is sent to me with some trouble of vision, as one of many symptoms, and I report back "marked *ischæmia* of both disks" to the attending physician. Now Mr. Allbutt's book will tell him in very attractive English, and very truthfully, what *ischæmia* of the disks is, and what it may signify in the present light of our knowledge, assisted by the ophthalmoscope. We do not mean at all to convey the idea that every doctor can or ought to be a good ophthalmoscopist, but we do hold that every general practitioner who attempts to treat or diagnosticate cerebral troubles should have the whole light of the ophthalmoscope, which fact Mr. Allbutt's book will prove to him if he will read it attentively. This he will not fail to do when he has once commenced, since the style is so attractive and the garb in which the publishers present it so pleasing to the eye. There are some excellent colored prints of ophthalmoscopic views in "congestion papilla" and "neuritis from lead poisoning," with other simpler wood-cuts.

Lymph Follicles of the Conjunctiva of the Eye. Dr. SCHMID. Wien: 1871. With three chromo-lithographic plates most beautifully executed.—I give here the concluding paragraphs of this monograph:

"On the epithelial edge of the conjunctiva of new born animals there is at definite points, quite distinctly marked, a sort of tissue which may be characteristically named adenoid tissue in recalling its histology. This tissue formation will also be found in young animals on the other parts of the epithelial layer of the conjunctiva. In the precise and peculiar grouping of the elements composing it, however, lies the distinguishing data to be particularly noticed. A point of external recognition is the rising of the epithelial border of the conjunctiva, which stretches over this when the adenoid tissue covers a larger surface. When, however, accumulations of this sort of tissue begin to be apparent, the even elevation of the epithelial layer becomes in accordance with the circumstances, wavy. The bloodvessels I may say rise or stand out as if their duty was to form a framework for the forming follicle. In the meshes of the thick vascular anastomoses which permeate the tissue, the elements collect which finally make the true contents of the formation. Thus in further development the simply sketched picture takes a more definite form. The points of concentration supplant the adenoid tissue. On the other portions of the conjunctiva there is a change to the common base tissue with fibrillar character. This forms in definite order also the envelope of the follicle, now becoming more distinct from its surroundings. This peripheric limitation by a web of connective tissue concentrically arranged is sometimes plainer, sometimes less so. By contact with a structure of similar character, a delicate limiting sheath is formed, the connective tissue net not losing its strength from the follicle being surrounded by differently formed tissue. In the course of development, the larger blood-vessels are more restricted to these tissue threads. Whilst rich anastomoses permeate the adenoid tissue, the original substratum of the follicle, the capillaries in the more developed structure are limited to certain portions only. The lymph-vessels finally surround the follicle. This development of the follicle, which

I have thus sketched, is complete at the end of the third week of extra uterine life.

It would be very curious that the conjunctival follicle alone should remain stationary at the stand point of development. Certainly it depends also upon the whole organism; the changes of the latter cannot but influence the former. The conjunctival follicle must needs feel the effect of the general change of tissue.

The disposition to formation of the follicles expresses itself at those points which form in the grown individual the points of predilection of this formation. In animals with two points of predilection this disposition expresses itself more strongly in one of the two in accordance with the relations of adult age. The arrangement of the formative structure for follicles, perfectly corresponds with what is found in full-grown animals. The same isolation of structure is seen in both, and the connected follicular grouping of the adult is indicated in the young. The form of the follicle in the young animal imitates that which characterizes the species of the adult. The developed follicle may alter in magnitude, but its shape remains constant.

On Traumatic Cataract, with Results of Sixty Operations. J. R. WOLFE, M.D. British Medical Journal, February and March, 1872.—The operations he has adopted, are the following:

1. Linear extraction, with the lance-shaped knife. This is applicable to cases of young and middle-aged persons, who form the largest class subject to traumatic cataract.

2d. The author's method with the corneo-conjunctival flap. I have employed it only in treating patients above the age of 50. It rendered me essential service in cases complicated with partial opacity of the cornea. No other method would have answered so well.

3. Linear extraction through the cornea with Græfe's knife is in some cases much to be preferred to every other method. Whether Græfe's operation will continue to occupy that high place which it now holds in the estimation of some of our eminent operators, time will show; yet there can be but one opinion as to the value of his cataract knife.

These operations I have employed according to the following plan:

1. When the lens is totally dislocated or broken into fragments, I remove it by the lance-shaped knife.

2. When the whole lens cannot be removed, I take out only the broken fragments, perform iridectomy, and leave the rest, which if not removed by the action of the aqueous humor, may be dealt with subsequently; but in no case would I use a curette or any traction instruments to remove lenticular débris.

3. When the capsule is but slightly torn, I open it freely with a needle so as to bring the whole lens under the action of the aqueous humor, and then I remove it subsequently.

4. When the iris has been lacerated, I remove the injured portion and leave the lens, if not dislocated, to be dealt with at a future period.

5. In patients above the age of 50, when the lens is not broken up. I make an iridectomy, and extract the lens by the small flap at the same time, when urgent, or else at a subsequent period. In short, the principle on which I act is, not to do much at a time, but to proceed cautiously and safely as far as the recuperative powers of the organ will admit.

Mr. Wolfe reports sixty operations on traumatic cataracts, and gives in his table the result of vision, as "*good*" in 51 cases, "*medium*" in 8, and "*not ascertained*" in one. We cannot, therefore, decide what success he has met with till these terms are translated into the language used and understood by ophthalmic surgeons throughout the world.

He read a paper on this subject at the Ophthalmic Congress in London, August, 1872, which will appear in the Proceedings of the Congress.

Étude sur les Amblyopies et les Amauroses Syphilitiques. Dr. X. GALEZOWSKI. Archives Generales, January, 1871.—I give his "Conclusions":—

Having studied most carefully syphilitic amblyopia and amaurosis in reference to their locality, we have arrived at some important conclusions as to their diagnosis and treatment, which we may express in the following aphorisms.

1. Syphilitic retinitis and neuritis may exist without alteration of the choroid, and most frequently in the form of apoplectic and exsudative retinitis. These, however, are but exceptional.

2. Syphilitic retinitis does not present pathognomic signs to distinguish it from other forms of retinitis.

3. But if the retinitis or neuritis optica are accompanied with iritis or choroiditis, with or without floating opacities in the vitreous, there is no further doubt of the affection being syphilitic. Experience has taught us that there is no other affection except glaucoma which causes at the same time retinal apoplexies and iritis or choroiditis.

4. Troubles of the chromatic faculty are constant in these two forms of ocular changes, especially in optic neuritis.

5. The most efficacious treatment of these diseases is the use of iodide of potash and sublimate in very large doses.

6. Syphilitic choroiditis is one of the most frequent forms of syphilitic amblyopia and amaurosis. The signs are very characteristic, and we may say even pathognomic of syphilis. They are: (1) Trouble with, or loss of, vision in sudden attacks or crises, often at long intervals; (2) a cobweb-like mist constantly floating before the eye; (3) very frequent photopsies; (4) photophobia; (5) hemeralopia when the disease is further advanced; (6) retained central with diminished peripheric vision; (7) cloudy papilla; (8) pigmentary retinitis at an advanced stage of the disease; (9) atrophy of the central vessels of the papilla with retention of the rosy tint, due to cerebral vessels nourishing the optic nerve.

7. Pigmentary retinitis develops very often as a sequela of syphilitic retinitis.

8. These pigment spots are strewn along the retinal vessels; but they form besides circular accumulations like rings of herpes circumatus.

9. Acquired syphilitic pigmentary retinitis does not differ from congenital pigmentary retinitis, especially the form now supposed to be due to the parents' consanguinity, except in the circular shape of the pigment patches.

10. Congenital pigmentary retinitis is from hereditary syphilis.

11. Congenital pigmentary retinitis should be treated in infancy by a mercurial or potash course. After a certain age, the progress of the disease cannot be arrested, and it goes on to total loss of sight sooner or later in life.

12. Infants born of syphilitic parents should be soon examined by the ophthalmoscope, and retinitis if seen ought to be treated according to the indications above given.

Retinal Arterial Pulse in Insufficiency of the Aorta.—Dr. H. QUINCKE, in the *Berl. Klin. Wochensch.*, 1868, No. 34, and 1870, No. 21, calls attention to the occurrence of a spontaneous arterial pulse in the retina in cases of aortic insufficiency. More recently Prof. Becker and Dr. Sighting have studied up the subject, and will make an extended report in the *Archives of Ophthalmology*. They have found that in all cases of aortic insufficiency, *unaccompanied* with valvular trouble, there is retinal arterial pulsation, the more marked the greater the hypertrophy of the left ventricle. It only failed to be found when there was great anæmia or fatty heart. The arterial pulse is not only seen on the optic-nerve disk, but as far on the periphery as the ophthalmoscope allows us to see.

As is known, we may have a venous pulse in the retina as a normal physiological condition. An arterial pulse, however, means something abnormal. It is one of the signs of glaucoma; here, however, it is an intermittent pulsation of blood into the retina, whilst with aortic insufficiency all the qualities may be perceived, just as we distinguish them by our finger on the radial artery. We may count the frequency of the heart's contraction, the dilatation and elongation of the arterial tube (large and small pulse), the length of time of dilatation and contraction, and the intervening pause of each pulse wave (*pulsus celer et tardus*). In fact, the ophthalmoscope shows us directly the pulse curve. The dilatation of the arterial tube is best seen at a point of division, the elongation where there is an S-shaped curve. This curve becomes increased during the arterial diastole and quickly resumes its shape during the systole. Sometimes the whole retina thus looks sort of alive, or in motion. In some vascular arrangements on the papilla, the whole arterial twig rises with the heart's contraction, so that here also we have a peculiar rhythmic movement of the artery.

The most interesting point these observers have noticed was in a case of aneurism of the arch of the aorta. Here the artery pulsed strongly in the retina of the left eye, whilst hardly a trace of rhythmic action could be detected in the right eye. Seemingly this must be connected with the peculiar situation of the aneurism. Supposing this implicated the origin of the arteria subclava sinistra and the carotis sinistra, whilst the anonyma was not affected, and the action of the aneurism more especially on the left eye is explainable. It is possible we may thus have an additional means of diagnosing the existence and localization of aortic aneurisms.

These observations and deductions of Quincke, Becker, and Sighting give us further testimony to the value of the ophthalmoscope in general medicine, as Mr. Allbutt has recently shown in his work on the "Ophthalmoscope in Diseases of the Brain and Nervous System."

Treatment of Myopia. Prof. SCHIESS-GEMUSEUS, Basel, 1872.—He gives the details of 53 cases treated by Atropine in accordance with the method as previously published by his pupil Hirsch. In reference to final results he says, the time of observation subsequent to the atropine cure, varied between 27 days and a year. Of 101 eyes, 81 came under subsequent observation, and among them 56 showed a definite result; in two cases this was greater than the first effect, and

in twenty-three cases as great. The cramp of accommodation had not returned. In 17 cases there was no positive final result, the second measurement being the same as at the commencement of the atropine cure. In 8 the myopia increased in spite of the atropine cure. The greatest improvement was 1-10. In two progressive cases the atropine produced no effect on the degree of myopia. He concludes that atropine will in the large majority of cases cause a permanent improvement. In several cases of slight myopia this had entirely disappeared.

Two Cases of Extraction of a Cysticercus from the Human Eye. Shown at the Berlin Medical Society Nov. 22, 1871, by Dr. J. HIRSCHBERG.—The first case was interesting from the difficulty in operating, the second from the complete success of the operation. In the former the worm was deep in the vitreous, in the latter in the anterior chamber.

In the first part of November, 1871, a woman, 23 years old, applied to me. She was healthy and sound otherwise than that for the last year she had suffered from some defect of vision of the right eye, which at present allowed only fingers to be counted with difficulty at a short distance. The globe was unaltered, and in the still transparent vitreous I found a large, quite active cysticercus. As we know, such an eye must be lost, and there is even danger of sympathetic trouble in the other.* Thrice I have been forced to enucleate an eye holding a cysticercus, and thus had opportunity of demonstrating the anatomical changes produced by the parasite; and I have expressed the opinion that in all these cases, *when advanced*, this operation was preferable to attempts at extraction. In my present case, however, the conditions seemed sufficiently favorable, and the retention of the form and shape of the globe so important for the woman, still young, that I decided on extraction according to Graefe's plan.

The patient was lying, without anæsthetic, on the bed. I made the lower sclerotic section as if for cataract extraction, then did an iridectomy, opened the anterior capsule largely and evacuated the perfectly transparent crystalline fully and slowly. (Upon the last great stress should be laid.) I then let the patient sit up, and entered the vitreous with a little hook by which I drew, with great difficulty, the worm in its surrounding membrane forwards till it was seen by the eye. The patient's head was now bent downward whilst I depressed the edge of the wound, when the entozoon slipped out. The wound healed *prima intentione*. Now, on the thirteenth day, the eye is perfectly quiet and its form completely retained.

The second case is in a certain way important in reference to the topographical seat of the cysticercus. The presence of the worm between the lamellæ of the cornea was stated by Appia, based on a briefly related observation.† This, however was doubted by competent authors.‡ My observation shows how an intra-lamellar (corneal) position of the worm may be simulated, when the animal, living free in the aqueous humor, occasionally fastens itself to the cornea. It is

* Compare this Archiv xlv. Also Knapp and Moos, Arch. for Eye and Ear, i. and ii. Also, Sitzung. bericht. berl. Med. Gesellschaft.

† Archives d'Ophthalmologie, par Jamain, July and August, 1853.

‡ Zehender's Handbuch, i. 228, Note 2. Weekers, Book i., 453. Appia's idea would not tally with the theory that the cysticercus germ reached the inside of the eye through the circulation. Compare the author's *resumé* of the literature of this subject in the Wiener Medic. Rundschau, Jan., 1870.

of interest also to notice that both parasite and host were relatively young—the former twelve weeks and the latter two years.* (Comparing the size of the entozoon in this and the former case with the sizes given in my previous accounts, and we shall get an approximate idea of the relations of growth of the cysticercus in the human eye.)

In March, 1871, a small boy was brought to my clinic who had suffered from inflammation of the left eye for three months. The mother had noticed a white spot upon it for the last four weeks. The eye was unaltered in size and shape, but showed marked pericorneal injection, as in severe iritis, a disease as we know that scarcely occurs spontaneously at so early an age. The cornea was clear and its anterior surface regular. In its centre was a grayish spot of about 1" diameter, which lateral illumination showed to be a delicate spherical vesicle with central white spot. In front of it was certainly a thick layer of corneal tissue; whether a thinner layer also was behind it, could not at once be decided. The aqueous humor was muddy, the pupil small and still undilated three quarters of an hour after instillation of a solution of atropine. I attempted at once to extract the worm under chloroform. On applying the speculum, the worm changed its place and moved free in the aqueous chamber. Instead, therefore, of removing the anterior lamella of the cornea as I had intended, I made a linear cut below with a lance-knife in the cornea, and removed the neat little cysticercus, which at once projected its head-piece. With pressure bandage and atropine the wound healed in two days, and the eye showed no irritation. Vision is now at any rate (Nov. 22, 1871) normal. A slight anterior synechia next the unimportant scar is all that remains.

Often as the cysticercus is with us found inside of the human eyeball, yet curiously enough it is rarely seen in the anterior chamber. Graefe saw only three cases, and the number of successful extractions has, since Schott's noted communication, remained very small. Yet these cases are of great therapeutic value, since the eye, which otherwise is sure to be lost, may, by a simple operation done at the right time, be saved with certainty.

Intra-ocular Tumors. Dr. A. Z. GILL, St. Louis Medical Journal.—He reports seven cases of operations, which are tabulated as follows:

No.	Variety.	Eye.	Age.	Operation.	Result.
1	Melano-Sarcoma	O. D.	60	Enucleation	No return in orbit
2	Glioma	O. S.	2½	"	Died in 4 months
3	White Sarcoma	O. S.	19	"	No return thus far, 16m
4	Melano-Sarcoma		35	Removed	Died 8 months after
5	Glioma		2½	"	Died within 4 months
6	Glioma	O. S.	2½	"	Died in 8 months
7	Glioma	O. D.	5.10	"	Died in 1 month

* Graefe's Archiv, 12, 2, 174. He found in his 80 cases of intra-ocular cysticercus (among 80,000 patients) that the youngest host was 8 years old. I extracted a cysticercus from the lower lid of a child 3 years old. Berl. Klin. Wochenschrift, 1870.

The microscopical appearances are given and compared with others' results. The theory of origin is dwelt upon and the retinal anatomy explained. His conclusion support early operation always.

Communications of the Retina with the Brain. BROWN SEQUARD'S Journal, March, 1872.—Clinical facts and experiments lead him to the following conclusions: 1st. Either half of the brain suffices for vision in both eyes, and each optic band puts in communication its corresponding half of the brain and the two halves of the two retinæ. 2d. Amaurosis, in cases of lesion of one optic band, the tubercula quadrigemina or of other parts of one half of the brain or one side of the cord, depends not on loss of function of the conductors of the visual impressions, or of one point of the percipient centre of this impression, but rather depends on the influence exercised on the nutrition of the eye, the optic nerve, or other parts, from the irritation arising from this lesion.

On the Formation of so-called Vitreous Bodies (Colloid) of the Human Choroid and the Cause of the hyaline Degeneration of the Vessels. By Dr. Alexander Rudnew, Docent in Ophthalmology at the University at Warschau. Virchow's Archiv, Vol. 53, 1871.—Ophthalmologists are familiar with the vitreous bodies frequently seen on the inner surface of the human choroid. They are readily recognized on examining different choroids under the microscope. Donders and H. Müller have carefully studied and accurately described them. Donders in Graefe's Archiv, 1855, under the title "Die Metamorphose der Pigmentschicht der Choroidea." Müller's article is in the same Archiv, 1856, under the title "Untersuchungen über die Glashäute des Auges insbesondere die Glaslamelle der Choroidea und ihre senilen Veränderungen." In Wedl's Handbook, and also in his Histological Atlas, these bodies are described and figured. Since Donders and H. Müller's special studies, cases have been reported in ophthalmic literature by Heymann, Donders, H. Müller, Junge, Schweigger, Pagenstecher, Schiess-Gemuseus and Rudnew. (The translator would refer to the original for references.)

Donders and H. Müller attributed to these bodies at least a mechanical action on the retina, and an interference with the latter's physiological function. I therefore determined to ascertain in every eye that came into my hands the presence or not of these bodies on the choroid. By the examination of a large number of eyes, I became acquainted with all Donders's and Müller's described processes. The more I examined, under the microscope, the choroids containing these bodies, the oftener I met with such appearances as did not tally with the former views as to the cause of this morbid process, and I was induced to explain their development in quite a different way. I pursued, therefore, a special study of these vitreous bodies, and the following is the result of my examination, which I submit for general judgment. (The method of preparing the specimens is omitted by the translator.)

Examining now a portion of the choroid where the vitreous bodies are of some size, under the microscope with $\times 300$, and we shall have the following picture (figured in the original). The whole surface turned towards us is an unbroken net of capillary vessels, generally more or less filled with white and red blood-corpuscles. The blood injection of the vessels varies greatly in some cases. When the injec-

tion is excessive, it may be attributed to the choroidal hyperæmia present during life, as was remarked by H. Müller among others. The varicose distention of the capillaries is often very visible. This capillary injection renders the subdivision of the vessels quite distinct. The vessel's walls are generally seen when there is no injection. Beneath the capillary net is seen a greater or less amount of the stroma of the choroid, with stellate pigmented cells and vessels, which do not correspond to the veins or the arteries, nor in size to the capillary net. They are rather vessels passing from the capillaries to the veins. The elastic membrane lying in the preparation under the capillaries will be scarcely noticed, since it is perfectly transparent and extremely thin. Hence we can see through this elastic membrane the vitreous bodies. Examining these in different directions we may be convinced that they project above the capillary layer, and have in general a globular shape. Their free upper surface is perfectly smooth and glistening, their edges are often sharply defined from their surroundings. The substance of these bodies is perfectly homogeneous, yellowish but transparent, allowing the vessels lying beneath them to be seen shining through. Occasionally, from irregular pressure of the covering glass, depressions are seen on the surface. At last they yield to strong pressure, the depressions become cracks, and the whole body breaks up into separate pieces. Chemically, these bodies show great durability. Water maceration does not alter them perceptibly. Weak acids and weak solutions of alkalies do not act upon them. Strong acids and alkaline solutions render them somewhat paler and duller. In caustic alkalies with high temperature they readily swell up. Strong sulphuric acid renders them browner, and finally destroys them. Iodine colors them yellowish, and sulphuric acid added produces no further change. Alcohol and ether do not dissolve these glassy masses. Their chemical properties are thus so indefinite that Donders used the term *colloid* for them. H. Müller compared them with the substance of the vitreous membranes. Their substance must, of course, be regarded as an organic product, the result of some unknown change of the albuminous material. Chemical examination tells us so little of their nature that we omit this part of the question, and pass to that which we more especially undertook, namely, their histology.

As to the mutual relations of these vitreous bodies and their distribution on the surface mentioned, it is to be noticed that they are found separate, with intervening space, or in groups, the individual bodies sometimes joining into a common mass. We saw now and then two joined in biscuit shape, as though formed by the fusion of two equal globes, and sometimes on the edges of a body thus shaped were smaller attached globules.

After this general view of the larger bodies, we must turn to the smaller ones. These are marked by their shape, broader than thick, flattened. In profile we see that they project above the plane of the subjacent part. The outline of these masses is often quite indefinite, so that they appear like glistening spots, inducing H. Müller to call such formations "washed spots." Within these flat bodies are often seen roundish spaces of various sizes, probably filled with a peculiar material, reacting to light very differently from the rest of the mass. These spaces within the vitreous bodies often have the form of cell nuclei, and then the whole vitreous body would represent a cell. H. Müller remarked this, but did not explain it.

As to the position of these young vitreous bodies described, it is to be noticed that their point of attachment generally corresponds to the intervascular substance. But if their size exceeds the space of the intervascular substance, then a part laps over the adjacent vessel. As to other peculiarities, it is difficult to make out any difference between the larger and smaller vitreous bodies, and hence we must regard the latter as of the same vitreous formation only in an earlier period of development. We finally succeeded in finding in the vitreous bodies the accompanying substances described by Donders and H. Müller, in the shape of small round masses. They resembled fat globules, but chemically they acted as mineral deposits. They are generally within the vitreous body, in the younger ones grouped at the point of the above-mentioned nucleus formation. In respect to the distribution of the vitreous bodies, it should be added that in the cases we saw they were scattered throughout the whole choroid from optic nerve to ora serrata. In general more thickly strewn at the equator of the eye.

As to the development of this process at different ages, Donders's and H. Müller's views are already known. According to them, they occur more frequently in the eyes of very old people. Müller reported these changes described almost entirely in subjects from 60 to 70 years of age. I can add but little new on this point to Donders's and Müller's observations, yet I must say that I found these bodies quite developed in people of middle age, and, on the other hand, much less so in those of 70 years. I found the vitreous bodies, with the mineral salts deposited in them, in the eyes of extremely aged subjects.

In deciding the development of these vitreous bodies, their relation to the surrounding tissues must be taken into consideration. The pigmented epithelium of the choroid cannot be excluded from taking part in their formation, but its alterations are passive, and only visible at the points where the colloid is extensive. I have figured a single body on whose summit no trace of pigmented cells was visible; there remained only a few pigmented nuclei of the broken-down cell. On the smaller vitreous bodies well-preserved cells are distinguishable. Hence we may conclude that these cells are destroyed simply by the pressure which the vitreous bodies exert on them, and that Donders's idea of the formation of these bodies from the nucleus of the pigmented cell is incorrect, so that their development has no connection with epithelial cells. On the other hand, let us examine these colloid bodies in reference to their connection with the tissue of the vascular layer of the choroid, and we may readily convince ourselves from transverse and flat sections that the connection of these bodies with this tissue is a very intimate one.

Whilst we can readily wipe away with a brush the epithelial cells from the upper surface of the colloid bodies, we cannot wipe off these latter from the tissue of the vascular layer. Whence this firm connection between colloid bodies and vascular layer? Müller would thus explain it. The colloid masses are products of the pigmented cells of the vascular layer and extrude from these cells into the free surface of the elastic membrane. Were this so then the younger ones would be easily wiped off, which is not the case. My examinations have, on the contrary, convinced me that the colloid bodies are never on the free surface of the elastic membrane, but, on the other hand,

under it. Whence now and from what elements of the vascular layer do the colloid bodies come? Since the younger ones still retain the cell character, we must assume that they come from a regressive degeneration of some morphological element found in the vascular layer.

It is now known that in the vascular layer—in the normal condition in less numbers, in the inflammatory condition in groups—are found small round cells having all the characteristics of white blood-corpuscles. Since the recent discovery of the migration of white blood-corpuscles, no one will doubt but that we here have such an emigration, and that the colloid bodies of the choroid are just these emigrated white blood-corpuscles. The proof is, that in my preparations may be followed all the transition forms of the white corpuscles into colloid or vitreous bodies. In one I have figured, we see the newly emigrated, still unaltered white blood-corpuscle; another, larger, losing its cell character, becomes more compact, glistening and more indifferent to the action of reagents. Later, the nucleus disappears, and then the cell character is lost; in a word, the blood-corpuscle becomes a colloid body. When, during this process, several blood-corpuscles run together, we have those extended masses of colloid mentioned above. Often during this change a deposit of mineral salt occurs. Here and there the largest colloid masses push up the elastic membrane towards the centre of the globe, finally break through it and become free. We would once more recapitulate. 1st, that colloid bodies are emigrated white blood-corpuscles; 2d, that they are formed by regressive metamorphosis of these latter; 3d, that they may occur at any age, since the conditions for this emigration occur at every age; 4th, that the more frequent appearance of colloid in old people is readily explainable by the fact that the stases in the vessels are much more common in them than in younger persons.

Let us pass now to the hyaline degeneration of the vessels. I saw this degeneration very marked in one case where there was purulent inflammation of the pia mater of the brain. This purulent process was also strongly developed in the choroid of the eye. In microscopic preparations I saw very extended vitrification of the walls of the vessels of the choroid. Some vessels were quite plugged by the glassy masses. This process has long been recognized. Junge and Pagenstecher found it in *retinitis pigmentosa*. Müller and Schweigger described the same with Bright's disease of the kidney. I have frequently seen this degeneration in cases where I found purulent inflammation of the choroid. Hyaline degeneration of the vessels was, as a rule, associated with greater development of colloid. The vitreous masses thickening the walls of the vessels, and even completely plugging their calibre, had the following peculiarities:—they were homogeneous, pretty transparent, strongly refractive and withstood the action of several reagents, as acids and caustic alkalies. They did not, however, exhibit the character of an amyloid, a fat corpuscle, or a mineral concrement. By more careful examination, we saw that the mass was not always wholly homogeneous, but here and there seemingly composed of separate bodies welded together, the points of union being designated to the eye by faint lines. Besides these glassy masses completely filling the lumen of the vessel, I noticed in several, completely isolated colloid bodies, by

whose junction and aggregation these compact glassy masses were formed. From all this, I feel authorized in concluding that the alteration of the choroidal vessels is due to the same process as I have attributed the existence of the colloid bodies. That the vitreous masses we have described are not due to common thrombus or to embolus is proved by the fact that they possess none of the characteristics of the fibrinous plugs.

From all these examinations may then be deduced, that the white blood-corpuscles are not only the source of organized new formations, as pus or granular tissue, but serve also for the development of such pathological products as are placed by their cause in the category of regressive products.

Time requisite for Visual Perception. BAXT, in Pfluger's Archiv, iv. 325-36.—He arranges an apparatus by means of which the image of a number of black figures printed on a white ground could be allowed to fall on the retina for any fraction of a second, at the end of which time the impression was succeeded by a very much stronger stimulus. In this way could be estimated the time which simple impressions require in order to affect consciousness. For the time requisite for perception is that time after which a weaker impression can no longer be effaced by a stronger one. Within certain limits, it was found that the time requisite for the first impression was independent of the degree of illumination of the object. The experiments showed that consciousness is able only gradually to elaborate a given impression, and that between the direct stimulus and the perception in consciousness, one-twentieth of a second intervenes. In regard to the extent of the perception, the results showed that in all degrees of intensity of the impression a much longer time is necessary to perceive small objects (such as intervals of space) than large ones. Thus, with a duration of the impression for 0.0005 second, and good illumination, large letters could be distinctly perceived, while smaller ones of the same form were very indistinct or quite imperceptible. Further experiments in reference to Fechner's psychological law, "that differences of illumination are more easily perceived the less the general degree of illumination," proved that in proportion to the difference in the illumination of two different objects, the time requisite for perception diminishes.

Time necessary for Vision. OGDEN R. ROOD, Am. Jour. Sci. and Art, 3, S. 2, 159, shows that letters on a printed page are plainly seen, with a polariscope the cross and rings round the axes of crystals observed in detail, and errors in the azimuth of the analyzing prism noticed, by an electric spark whose duration is only forty billionths of a second. Subjective optical phenomena can also be produced, such as Lœwe's rings, and the radiating structure of the lens perceived if the light falls in a proper direction. As the obliteration of micrometric lines in the experiment could only be produced by the retina retaining and combining a series of impressions whose joint duration is forty billionths of a second, a less time is sufficient for the production of each. If the number of veins of lines presented to the eye be limited to ten, then four billionths of a second would be sufficient for each. Nor is this astonishing; for, assuming the undulatory theory of light to be true, in this short period two and a half millions of waves of light reach the eye.

Spectra of Motion. DVORAK, Wien, Akad. Sitzb 2, Abt. 61—257=

262, seeks to explain the subjective sensations of motion which are observed when the eye has been fixed long on a moving object. Helmholtz explains them by unconscious movements of the eye, and brings them under vertiginous phenomena. Dvorak mentions several facts which, in his opinion, show that the spectra are really local phenomena, and of the same nature as light and color spectra.

Shultze's Archiv f. Microsc. Anat. Band 7, heft 3, p. 251.—Shultze holds that as it now stands, the following may be said in reference to the termination of the optic nerve fibres in the retina.

1st. The outer granular layer contains radial nerve fibres known as the rod and cone fibres. As Shultze first proved for men and mammals, these have all the attributes of those sort of nerve fibres which are found in the optic layer of the retina, generally called naked axis cylinder, consisting of a larger or smaller number of primitive fibrillæ. Contrary to all doubts lately expressed, repeated new examinations with improved methods have proved the perfect correspondence of the rod and cone fibres with the nerve fibres of the kind above mentioned. These undoubted nerve fibres are bedded in a spongy connective tissue explained in the memoir *de Retinæ Structura penitiori*, 1859. This connective tissue in man and mammals, and also in fishes, is considerable, thickening the external granular layer. It is readily softened by maceration, and the nervous rod and cone fibres drawn out free. In birds, reptiles, and amphibians, the relations are different from the thinness of the outer granular layer, long rod and cone fibres not thus occurring, and the connective substance forming firm sheaths around the nervous elements of the outer granular layer, thus rendering the distinguishing the two elements unsatisfactory. Landolt has lately attempted a not perfectly satisfactory separation of the two. Landolt's "Kölbenförmiger Körper," of this layer is still indefinite.

2d. The cone and rod granules are nucleated swellings of the cone and rod fibres, hence bipolar nerve cells, ganglion bodies whose substance receives the fibrillous substance of the nerve fibre, the nucleus being bedded in it. Curiously enough, in man and mammals, as a rule, the peripheric prolongation of these rod and cone fibres, that is, the part extending to the *limitans externa*, is considerably thicker than the central part reaching to the external granular layer.

3d. The inner member of the cones and rods is a direct continuation of the cone and rod fibres, and hence to be regarded as nervous. The contents exhibit in men, best in the cones, a division into fibrillæ, but here there is great variation. Now the fibrillous structure does not immediately join the cone fibre, but commences a little outside of the *limitans externa*. The base of the cone inner member does not exhibit streaks; this marking begins about the middle of the cone and reaches to the end of the inner member. The marking is very delicate, on the surface in streaks equidistant around the cone, converging towards the thinner outer end of the inner member, inside thickly packed, so that the number of individual fibres in a cone may reach a hundred or more. The marks or streaks represent fibres that are separable, having a peculiar shimmer, sharply defined from the intervening substance connecting them, and hence looking quite different from the axis cylinder composed of primitive nerve fibrillæ packed together. This fibrous cone Shultze calls the "fibre apparatus," "*Faden-apparat*."

Notwithstanding the difference in the method of refraction of light by the fibrous apparatus and the fibrillæ forming the cone fibres, and notwithstanding the lack of proof of continuity, yet a connection may exist. We need only suppose that the fibrillæ not generally seen, in the base of the inner member, so refract the light as to render their recognition impossible, but when they reach the outer portion of the inner member, they all in one plane change their character, assume another nature, and in this altered condition form the fibrous apparatus. Analogous terminations of other nerve fibres might be found, since most nerves undergo an alteration at their peripheral termination. When the outer member joins the inner member, the fibrillæ of the fibrous apparatus ceases.

On the other hand we might suppose that the peculiar brilliant cone fibres were organs *sui generis*, bedded in the nervous base substance of the cone interiors. In this case they would form a non-nervous apparatus as an assistant to changing the movement of light into nervous conduction, which, not composed of nerve substance, is in intimate union with it, an apparatus within which by repeated bending and reflexion of the incident light, an absorption may take place (that is, the changing of light waves into another form of motion).

4th. Finally, as to the connection of the inner and outer members of the rods and cones, this, so far as direct observation can show, is produced by a very delicate fibrous sheath. Whether nerve fibrillæ are held in this or not, is at present quite doubtful. Probably the delicate fibres of the upper surface come principally from the fibrous basket of the inner member. The same form a fibrous net or basket also around the outer member, which, when definite longitudinal furrows exist on the surface of the outer member, lie in them, and here again come in contact with the pigmented and non-pigmented prolongations of the pigment cells, possibly in continuity with them. The outer member, in accordance with Brücke's theory, is generally considered as purely an apparatus for reflexion. Schultze previously explained his position in reference to this theory, then thinking that the border surface of the inner member against the outer one, was the most probable perceptive organ for the reflected light. The plate structure he soon after discovered in the outer member, was a further proof of its perfect reflecting character. Meantime further examination of the anatomical connection of the inner and outer member led him to think that probably both possessed a common weakly refractive base substance of nervous character, in which in the outer member are embedded the strongly refractive plates, whilst in the inner a subdivision of another kind exists. Hence the continuity of the two structures must be established, this being necessarily a part of the visual act if the outer member participates in perception. Such a participation of the outer member, Hensen would prove in the cones of the fovea, the thicker cone bodies being the percipient organs, a more suitable anatomical substratum being necessary for the reception of minute pictures. Hensen showed that our percipient surface at the fovea was in fact, not continuous but broken, and that the interruptions or breaks of the intermediate spaces might correspond to the conical outer members of the cones surrounded by their pigment.

Not to mix the undoubted reflective function existing in the outer member with that of perception, Schultze proposes the hypothesis

that this last function in reality belongs at the border surface of the inner member. Thus the advantages of Hensen's hypothesis need not be given up, since this border surface in each cone of the fovea is still of less diameter than the thickest part of the inner member.

Now with the discovery of the plate structure and in view of Zenker's physiological observations in reference to this structure, Schultze feels compelled to change his views as to the meaning of the outer members. What seemed to him absurd, namely, the association of reflexion and perception in one and the same organ, now becomes a more acceptable hypothesis. The necessarily existing complicated internal reflexion attached to the plate composition or structure, the change of light movement into stationary waves, and the absorption, all afforded so many additional points to the further acceptance of the idea of the nervous character or meaning of the external member, that the hypothesis for complete proof needed only one further test, namely, the examination of the eyes of the invertebrate animals, and the proof that in these, also, where quite different layer structure existed in the retinal development, the *perceptive* layer contained apparatuses capable of similar conditions of reflexion as the outer member of the vertebrate retina.

The hypothesis has stood the test. Schultze has proved the existence of finely layered rods immediately on the vitreous and lens in the *articulates*. (Untersuchungen über die zusammengesetzten Augen der Krebse und Insecten. Bonn. 1868.) They are connected with nerve fibres coming to them, and are turned towards the light. From their plate structure, they reflect light, but the light so reflected enters again the refractive media of the eye.

Hence the function of the layered rods cannot consist in this reflexion of light. There remains, the internal reflexion of the innumerable reflecting surfaces of the plates which causes an absorption of the greatest part of the rays of light. This alone explains the presence of the layered rods. Schultze has also afforded the same proof in the *mollusks* (cephalopods and heteropods) (Archiv. f. Mikro. Anat. Bd. 5, p. 1). In these animals also there are layered rods against the vitreous, which receive the light coming through the latter, and return to it all the reflected light. Since by far the largest portion of the light entering the eye penetrates the interior of the long rods, and here is reflected by the hundreds of reflecting surfaces arranged behind each other, backward and forward, to be thus finally absorbed, therefore we must assume that it is this part of the light which is changed into nerve motion, or excites nervous irritation. For behind the rods and between them lies the pigment. *The layered rods alone of all the retinal elements are thus the transparent part.*

Since we may not assume that the layered rods in the eyes of the vertebrates and invertebrates, of similar structure and similarly related to the nerves, can have different functions, we may, from the conditions of the rods in the *invertebrates*, conclude that in the *vertebrates* this structure does not reflect in order that the light after reflexion may be perceived in the inner member, but in order that by the complicated internal reflexion a change of the light motion into nerve motion or irritation may take place, and thus the first steps towards perception be gained. In other words, it is most probable that nerve substance is in contact or continuity with the outer member.

In reference to the relation of the nerve fibres to the layered rods of the invertebrates, we only know with certainty, that in the cephalopods and heteropods the rods lie against the nerve fibres or the nerve fibres lie against the rods. A direct continuation of one into the other has not yet been observed. The rods embrace the nerve fibres, so that the latter fill up the interior of the former, or the nerve fibres run on the surface of the rods, which have for this purpose gutter-like impressions in which they lie. In the vertebrates, nerve fibres have been seen *within* the layered rods, and the same on the *surface* in these gutters. Both are at present hypothetical. As the subject now stands it is readily supposable that the view above expressed and previously supported by Schultze, is nearest the truth, namely, that the base substance of the outer member is perfectly of nervous character, as we have cause to consider is the case with the inner member, since this is a direct continuation of a nerve fibre.

Dr. Franz Boll, assistant in the physiological laboratory of the University of Berlin, published, in the number of Reichert and du Bois-Reymond's *Archiv* which appeared last May (Jahr. 1871, Heft v.—vi. pp. 530–549), an article on vision in the compound or faceted eye of the insect. He would bring us back to Müller's well-known theory of mosaic vision of the faceted eye, in other words, back again to the old dilemma of there being two forms of visual organs constructed upon entirely different plans. He begins by showing that Lœwenhock, the father of the microscope, was well aware of the formation of the picture of external objects behind each individual facet. If each of these pictures goes as such to the brain, then behind each facet must exist a retina composed of separated sensitive points. This means of course a number also of separated nerve fibres. Now although the researches of Max Shultze especially, have shown that several nerve fibrillæ may in some crabs and insects go to the posterior end of the krystallkegel, this is not always the case, destroying seemingly the retinal postulate of a large number of separated sensitive points.

Boll placed in humor aqueus, on the slide, the fresh retina of *Triton cristatus*, the inner surface downwards, and thus had under the microscope (Hartnack's ix. 2) a mosaic of the outer surfaces of the rods. Moving now a cataract needle between the mirror and object, there was seen through each rod an upright little image of the needle. Max Shultze saw these also in the *cones* of a snake's retina. These pictures are due to the lens-like body found at the junction of the inner with the outer member of the rod and cones. Now no one would deduce any physiological meaning, as respects vision, from these pictures due simply to the lens nature of these bodies, a physical curiosity. "Why is not the same applicable to the compound eye of the arthropods? Since we have seen by so clear an example as the rod layer of the vertebrate retina, that the pictures formed are not physiological, but only optical, inseparable from a lens structure, a physical curiosity—like the reflected picture from the human cornea—there is no difficulty in applying the same to the mosaic eye. As soon as we can free ourselves from the idea that the pictures from the optical apparatus of the eye, dependent on physical laws, are necessarily also physiological, that is, must be *seen* as such, and thus decide unbiassed the problem of mosaic vision, we shall then find

that the collected anatomical, physiological and psychological difficulties in the way of a physiological explanation of Lœuwenhock's pictures for the compound faceted eye of the arthropod, is scarcely less than for the rod layer of the vertebrate animal."

Boll then takes ground that—granted with Shultze, that several fibrillæ go to each krystallkegel—in the first place, this is not always the case; then too, these fibrillæ do not give the necessary postulate of a retina, viz., a very large number of separated (by pigment) and separably impressed recipient points. Moreover, there is no anatomical proof of accommodation in the faceted eye. And finally, he cannot overcome the psychological difficulty of the central organ of the insect being able to combine, in the majority of cases, at least one hundred pictures.

Boll goes on to discuss the question where in the vertebrate retina the perception of light takes place. And he explains the effect of the lens-like body under the four possible optical conditions from the position of the focus of the refractive media. Finally, he says: "Since the faceted eye can thus no longer be physiologically considered as an aggregation of simple eyes, we must necessarily revise the comparative-anatomy view of it, till now current in science." "What homologies exist between the compound eye of the insect and the vertebrate? Again, what analogies do we find?" "The homologies may include the optic nerve, the pigment, the mosaic arrangement of sensitive points, and the plate structure discovered by Shultze in the terminal nerve end of both types. The analogies, or as we may say, the functional agreements (*Uebereinstimmungen*) of the vertebrate and faceted eye, must now be regarded in a very different way from what most anatomists have hitherto done, since the compound eye is no longer to be taken physiologically as an aggregation of simple eyes. It seems inadmissible to compare the so-called cornea and krystallkegel of the simple eye functionally with the cornea and vitreous of the vertebrate eye, since behind the former there is only the physiological and morphological equivalent of a single rod, never a rod layer."

Boll finds the first indication of a correct valuation of the analogies between the arthropod's compound eye and the vertebrates, in an article of Brucke's (this *Archiv*, 1844, p. 451), where he says "the vertebrate rod layer cannot be better described than as forming a mosaic conglomerate, for isolation, behind the vertebrate eye which is wholly for refraction, to receive the light coming back from the choroid." [Translated from the *original* sentence.] Leydig, Boll grants, afterwards sought to carry out this thought further (this *Archiv*, 1855, p. 427), but not he thinks with special success in the details, and here he holds we cannot be too careful in our deductions. Boll does not quote from Leydig, and therefore I give a few sentences of the long article referred to. Leydig says: "I venture to believe that the material presented allows us to regard the *morphology* of the compound arthropod eye from a more general standpoint, and seek therein the analogies of the vertebrate eye." "I should thus draw a parallel between them. The cornea and the lens-like convexity inwards, correspond to the cornea and lens of the vertebrate eye. The krystallkegel substance (including the transparent mass behind the cornea, sheath of the krystallkegel and the krystallkegel itself), inclu-

sive of the angular nerve-rod, would correspond to the stratum bacillorum in the vertebrate eye. The optic ganglion has its analogy in the retinal layers composed of granules, cells and nerve fibres. The pigments are like the choroid and iris. The striped muscles have their equivalent in the muscular element of the iris and choroid." "Hence follow, according to my (Leydig's) interpretation, that the faceted eye does not correspond to a number of distinct and closely packed eyes, but is an organic entity, a single eye."

My opening page contains an homage to the dead. I gladly add here my tribute of congratulation to the living, in which each and every member of the Ophthalmological Society will most cordially join. The fifteenth of last October, Prof. DONDERS finished his twenty-fifth year of service as professor at the University at Utrecht. Past and present pupils joined in a celebration of the occasion. A committee had had two marble busts, executed by Drake, one of Joh. Müller, and the other of Hermann Helmholtz. These were presented to Prof. Donders, with appropriate congratulatory remarks by Dr. Hauben, in the Hall of Arts and Sciences at Utrecht, followed by Dr. Hellema in behalf of the surgeons of the army and navy of Holland. M. Vos also addressed the recipient in the name of his fellow students. Finally, M. Stern, in behalf of the Utrecht students, presented Donders with a medal, on one side of which was his own head, and on the reverse the inscription, "*Ræceptor carissimo socii senatus veteranorum et non pauci studiosorum Ultrajectino adscripti.*"

The felicity of Prof. Donders's reply may be well imagined by those who have fortunately heard him speak and seen his grace in presiding. A dinner of one hundred and fifteen covers closed the ceremonies of this pleasant day.

I would add that Prof. Donders has been chosen Honorary Member and Snellen Corresponding Member of the Royal Academy of Medicine of Belgium.

BOOKS, MONOGRAPHS AND JOURNAL ARTICLES NOT NOTICED IN THE REPORT.

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- Zur Lehre von der Hypopyon-Keratitis. Dr. Bokowa. *Zurich*. 1871. Pp. 54.
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